Berichte
aus dem
Institut für Meereskunde
an der
Christian-Albrechts-Universität Kiel

Nr. 49

1978

WASSEROBERFLÄCHENTEMPERATUREN UND LUFTDRUCKDIFFERENZEN IM AUFTRIEBS-GEBIET VOR NORDWEST-AFRIKA VON 1969 - 1976

SEA SURFACE TEMPERATURES AND AIR PRESSURE DIFFERENCES IN THE UPWELLING REGION OFF NORTHWEST-AFRICA FROM 1969 TO 1976

DOI 10.3289/IFM_BER_49

von

Holger Detlefsen

Kopien dieser Arbeit können bezogen werden von:

Institut für Meereskunde
Abt. Maritime Meteorologie

Düsternbrooker Weg 2o
D 23oo K i e l 1

ISSN o341-8561

ZUSAMMENFASSUNG

In dieser Dokumentation wird eine Auswahl der Daten gezeigt, die von SPETH, DETLEFSEN und SIERTS in [1] und [2] zur Bestimmung des Zusammenhangs zwischen dem Auftrieb vor der NW-Küste Afrikas und dem Wind verwendet wurden. Für fünf Schnitte senkrecht zur Küste sind Differenzen des Bodenluftdrucks (PD) dargestellt. Diese wurden als ein Maß für die Windstärke verwendet. Eine Beschreibung des Auftriebs selbst wurde durch Bildung von zonalen Differenzen (ZD) der Wasseroberflächentemperaturen (SST) erhalten. Dabei wurde von der an der Küste gemessenen SST die bei gleicher geographischer Breite gemessene SST des zentralen Atlantiks abgezogen. Zeitreihen der ZD und der SST an der Küste werden für 16N, 2oN, 22N, 25N und 3oN gezeigt. Um deutlich zu machen, ob schon eine kurzzeitige Änderung der Windstärke Einfluß auf die SST und damit auf den Auftrieb hat, werden sowohl von den PD als auch von den SST Schwankungen um ein übergreifendes Mittel gezeigt. Bei sämtlichen Zeitreihen beträgt die zeitliche Auflösung fünf Tage.

SUMMARY

This documentation shows a selection of the data which were used by SPETH, DETLEFSEN and SIERTS in [1] and [2] to determine the relation between the wind and the upwelling off NW-Africa. For five sections normal to the coast air pressure differences (PD) are plotted. These were taken as a measure for the wind speed. A description of the upwelling itself was obtained by forming zonal differences (ZD) of the sea-surface temperatures (SST). For this reason from the SST measured near the coast the SST measured at the same latitude in the central Atlantic was subtracted. Time series of the ZD and the SST near the coast are shown for 16N, 20N, 22N, 25N and 30N. In order to demonstrate to what extent a change of the wind speed causes a change of the SST fluctuations of the PD and the SST are shown too. In all time series the time resolution is five days.

INHALTSVERZEICHNIS

Seite

1. EINLEITUNG

Der vorliegende Datenband enthält eine Auswahl der in [1] und [2] verwendeten Daten zur Bestimmung des Zusammenhangs zwischen dem Auftrieb vor der NW-Küste Afrikas und dem Wind. Die Stärke des Windes wurde dabei durch Differenzen des Bodenluftdrucks (PD) angenähert, die an fünf verschiedenen Schnitten für die Jahre 1969 bis 1976 gebildet wurden (Abb. 1b). Zur Berechnung der Differenzen wurden die objektiven Analysen des Deutschen Wetterdienstes, Offenbach/Main, verwendet.

Die in [1] und [2] erhaltenen Ergebnisse haben gezeigt, daß man das Auftriebsgebiet grundsätzlich in drei Regionen aufgliedern kann:

a) 10N - 20N Auftrieb zwischen Januar und Juni
b) 20N - 25N ganzjähriger Auftrieb
c) nördlich 25N Auftrieb zwischen Juli und Dezember.

Die hier gezeigte Auswahl der Wasseroberflächentemperaturen (SST), zonalen Differenzen und kurzperiodischen Schwankungen der SST enthält jeweils eine Zeitreihe aus den drei Regionen bei 16N, 22N und 30N sowie die an den Grenzen liegenden von 20N und 25N. Bei den SST handelt es sich um fünftägige Mittelwerte aus 1°-Quadraten, die vom Meteorological Office - Bracknell, England, übernommen wurden. Abb. 1a zeigt die Quadrate, aus denen SST-Zeitreihen für die Berechnungen herangezogen wurden. Alle Abbildungen zeigen die Rohdaten.
Die zonalen Differenzen (ZD) wurden erhalten, indem von der an der Küste gemessenen SST die bei gleicher geographischer Breite im zentralen Atlantik gemessene SST subtrahiert wurde. Diese Differenzen bilden ein Maß für den Auftrieb. Um äußere direkte Einflüsse wie die Sonneneinstrahlung auszuschließen, wurde festgelegt, daß Differenzen von kleiner -3° Auftrieb bedeuten. Die kurzperio-

dischen Schwankungen der SST und der PD wurden aus den ursprünglichen Werten erhalten, indem von den einzelnen Werten ein übergreifendes Mittel, berechnet aus 7 Werten, abgezogen wurde. Diese Darstellungen sollen veranschaulichen, inwieweit schon eine kurzzeitige Änderung der Windstärke eine Änderung der Wassertemperatur nachsichzieht.

Wegen der großen Datenlücke im Jahr 1972 wurden für diesen Zeitraum keine Schwankungen der SST berechnet.

Die Darstellungen auf den Seiten 68 bis 71 geben die zonalen Temperaturdifferenzen zwischen den küstennahen Gebieten und dem zentralen Atlantik wieder. Da für einige 1°-Quadrate nur äußerst unvollständige Datensätze zur Verfügung standen, konnten diese Abbildungen nur für die Jahre 1969 bis 1971 sowie für eine mittlere Temperaturdifferenz des gesamten Zeitraumes erstellt werden.

Sämtliche gezeigten Daten (Druckdifferenzen und Wassertemperaturen) sind fünftägige Mittelwerte.
Die Darstellung der Daten ist folgendermaßen:
Zunächst werden für 1969 die Druckdifferenzen und deren Schwankungen für die Schnitte J=1 bis J=5 gezeigt (Lage der Schnitte siehe Abb. 1b). Im Anschluß daran folgen die SST, ZD und die Schwankungen der SST von 16N bis 3oN. Die Darstellungen für 197o bis 1976 und für die langjährigen Mittel sind dann entsprechend.

Die Druckdifferenzen und deren Schwankungen sind jeweils zusammen in eine Abbildung gezeichnet worden. Um sie besser voneinander unterscheiden zu können, sind die Druckdifferenzen durch durchgezogene Linien (——) und deren Schwankungen durch gestrichelte Linien (----) dargestellt. Die SST, ZD und Schwankungen der SST sind jeweils für sich unter Verwendung durchgezogener Linien (——) in ein Diagramm gezeichnet.

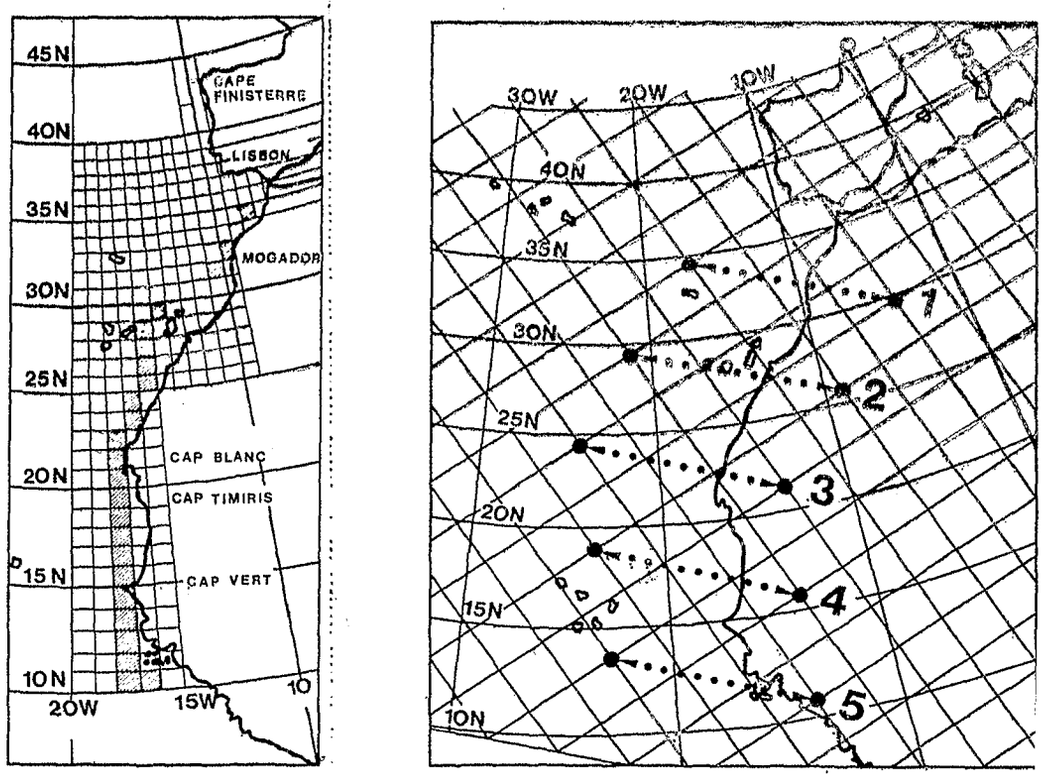


Abb. 1

a) 1^{o}-Quadrate, in denen Zeitreihen der SST zur Verfügung standen

b) Lage der Druckdifferenzen im DWD-Gitternetz

entnommen aus SPETH et al. 1978, Fig. 1

2. SYMBOLIK

SST	:	Wasseroberflächentemperatur
ZD	:	zonale Differenzen
OSZ of SST	:	Schwankungen der Wasseroberflächen-temperaturen
PD	:	Differenzen des Bodenluftdrucks
OSZ of PD	:	Schwankungen der Druckdifferenzen

Darstellungsweise in Abbildungen, in denen

a) Druckdifferenzen gezeigt werden

——— Druckdifferenzen

----- Schwankungen der Druckdifferenzen

b) Wassertemperaturen gezeigt werden:

——— Wasseroberflächentemperaturen

——— zonale Differenzen

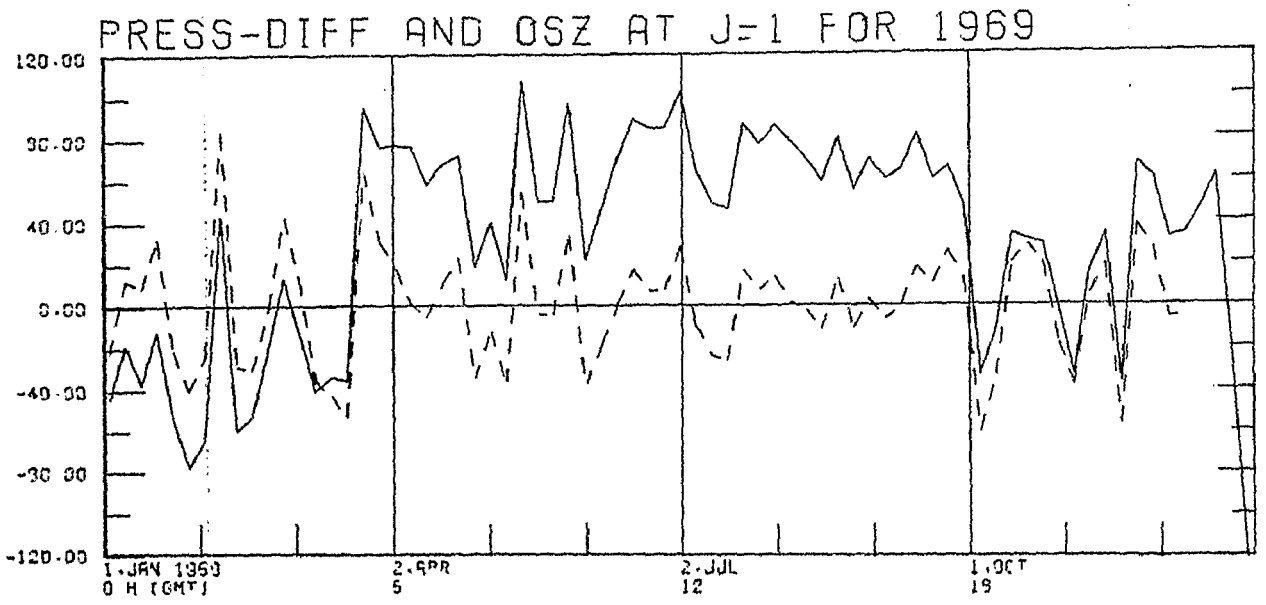
——— Schwankungen der Wasseroberflächen-temperaturen

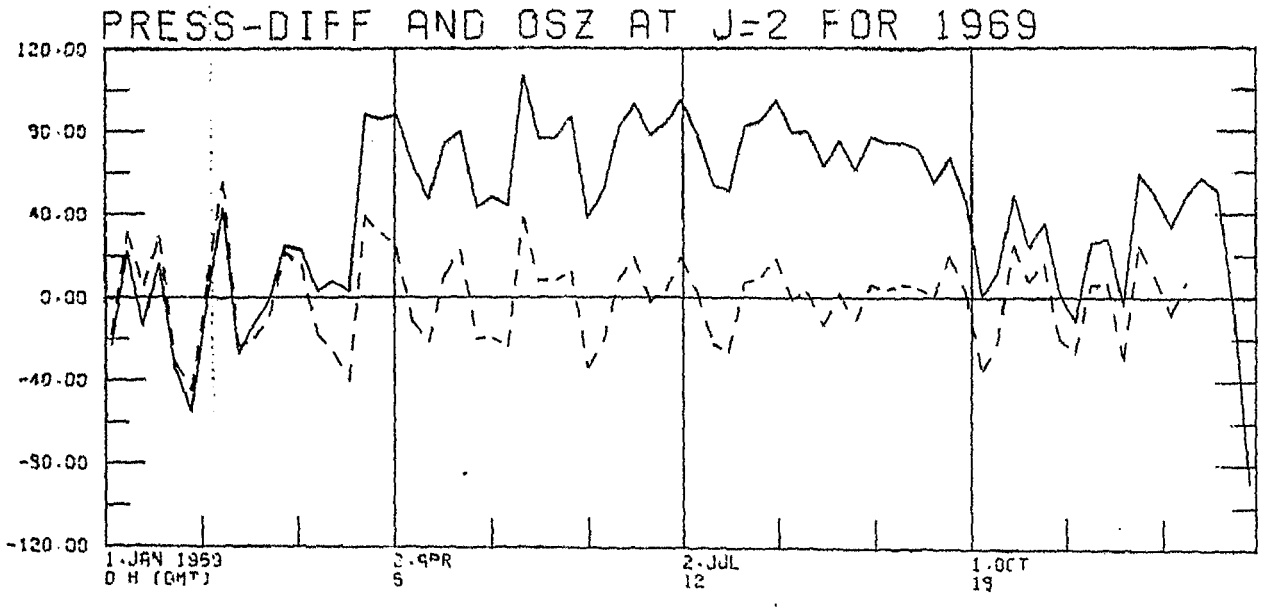
LITERATURVERZEICHNIS

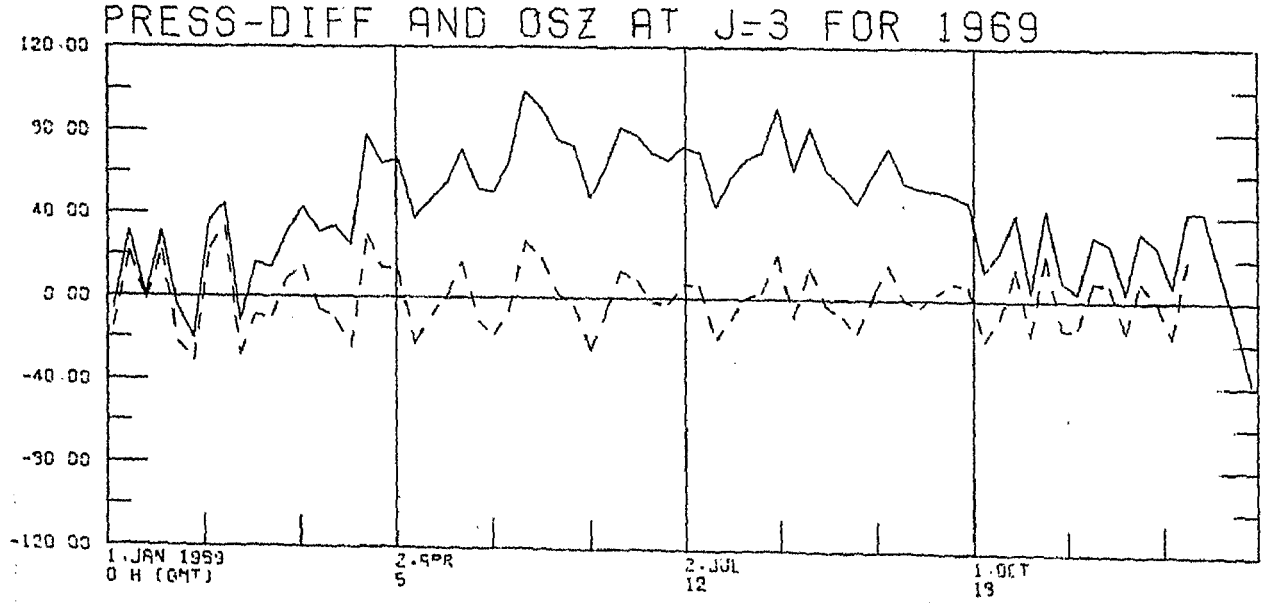
[1] Sierts, H.W., Meteorologische Einflüsse auf das Auftriebsgebiet vor NW-Afrika, Berichte aus dem Institut für Meereskunde, Nr. 33, 1977

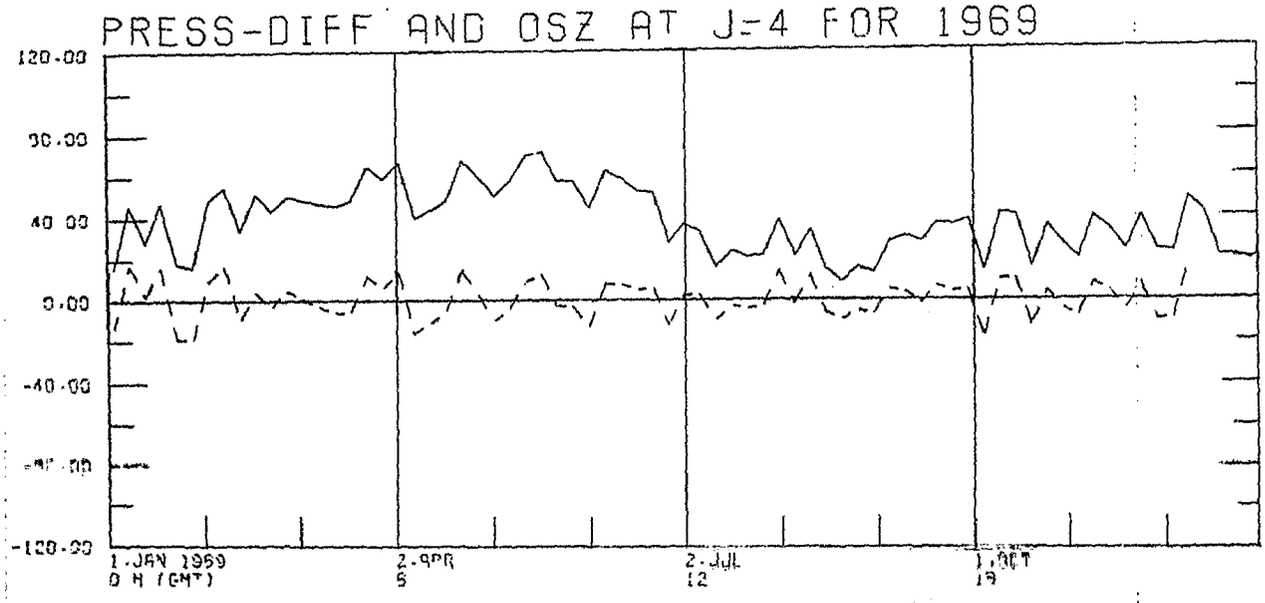
[2] Speth, P., H. Detlefsen, H.W. Sierts, Meteorological influence on upwelling off Northwest Africa, eingereicht bei Deutsche Hydrographische Zeitschrift, 1978

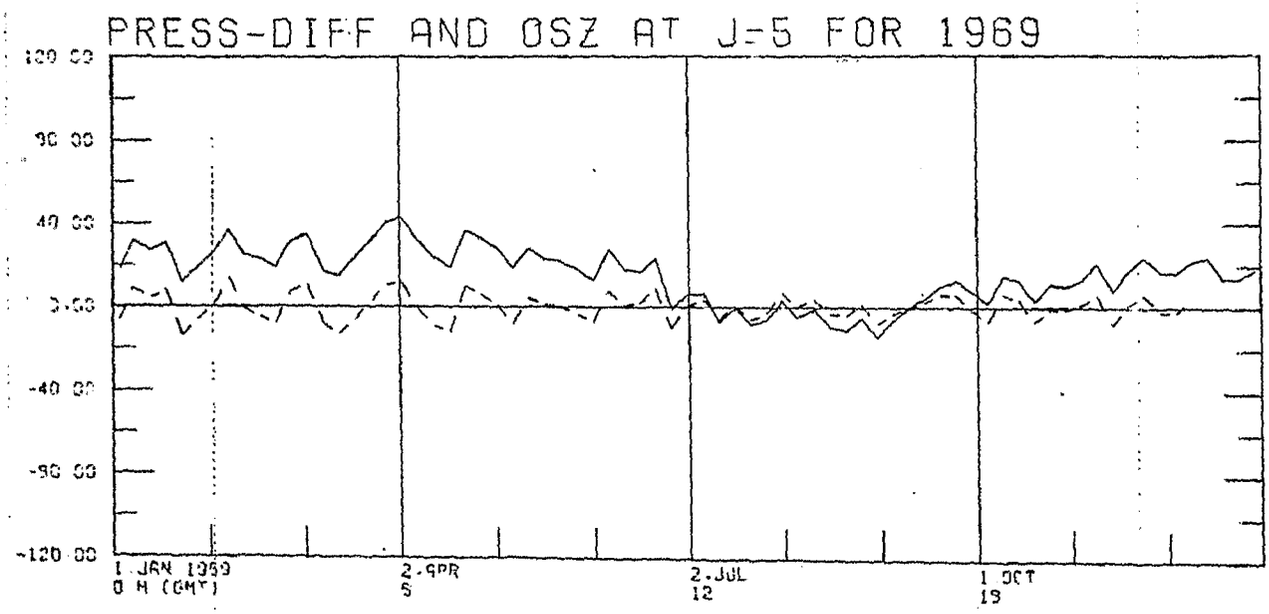
3. DATENDARSTELLUNG

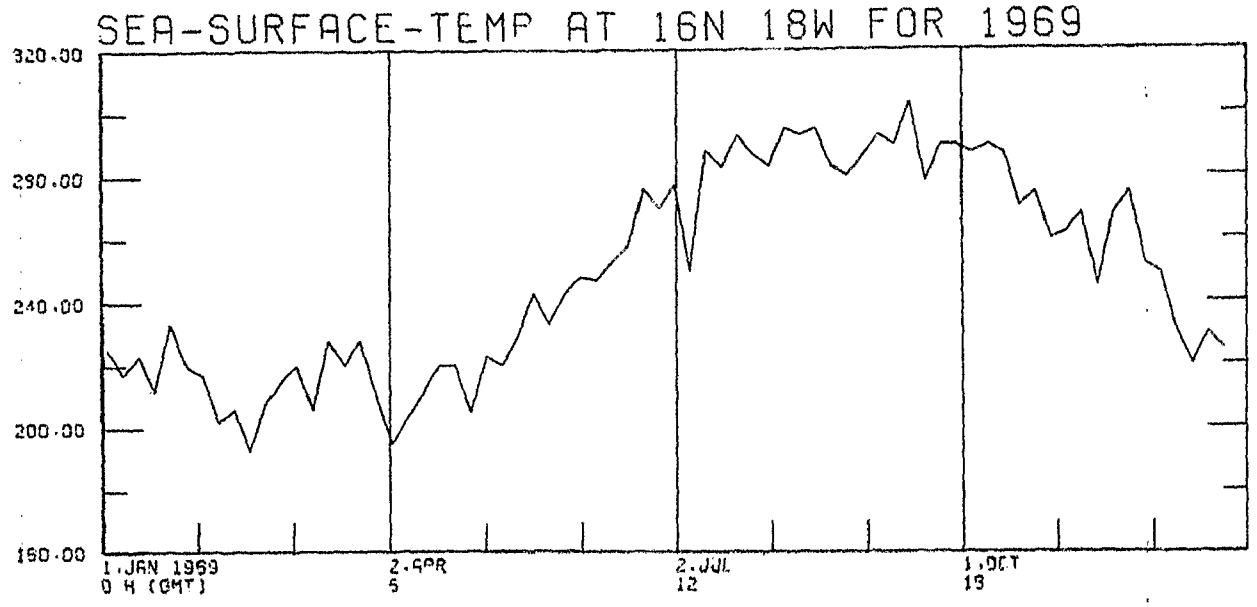

PRESS-DIFF AND OSZ AT J=1 FOR 1969
120.00
90.00
40.00
0.00
-40.00
-80.00
-120.00
1.JAN 1969
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

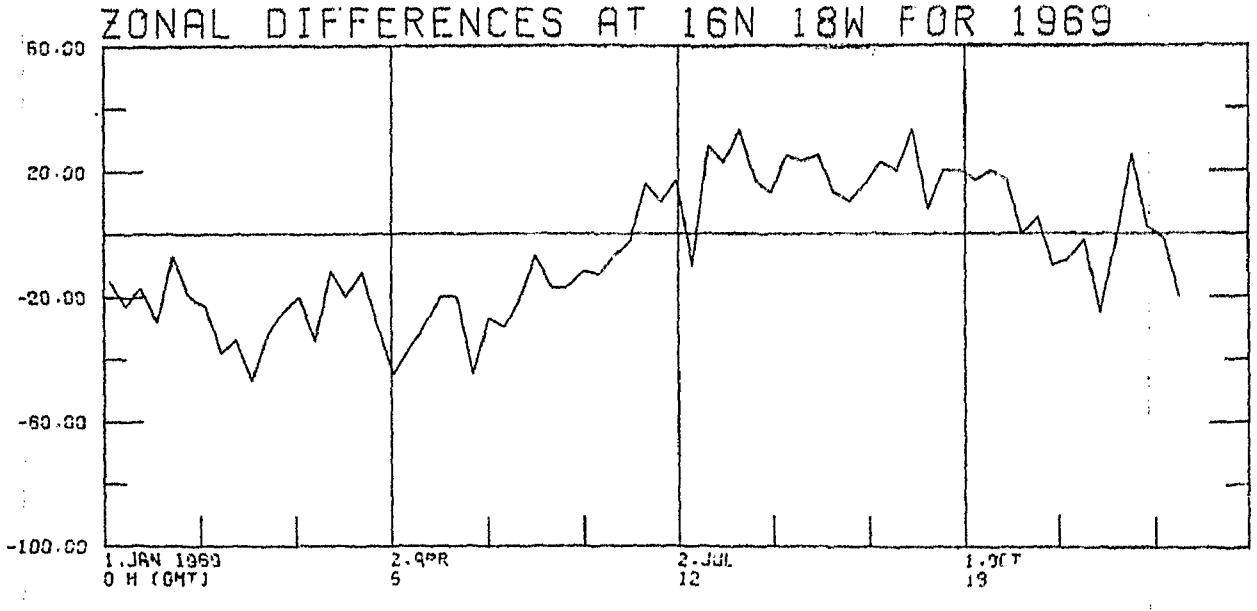

PRESS-DIFF AND OSZ AT J=2 FOR 1969
120.00
90.00
40.00
0.00
-40.00
-80.00
-120.00
1.JAN 1969
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

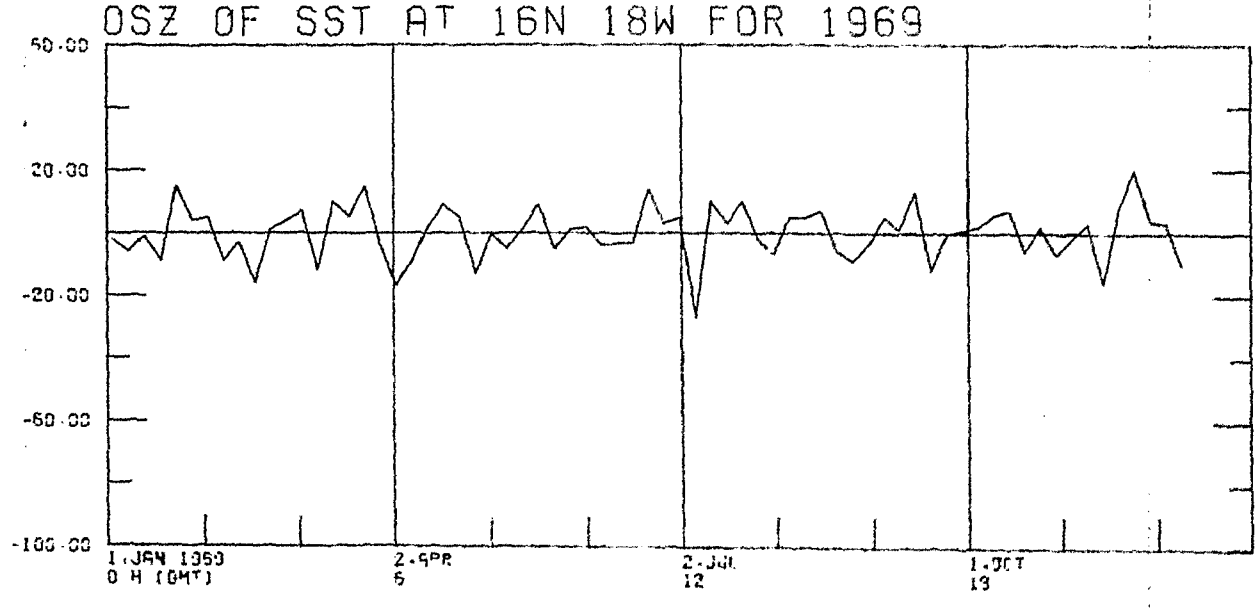

PRESS-DIFF AND OSZ AT J=3 FOR 1969
120.00
90.00
40.00
0.00
-40.00
-80.00
-120.00
1.JAN 1969
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

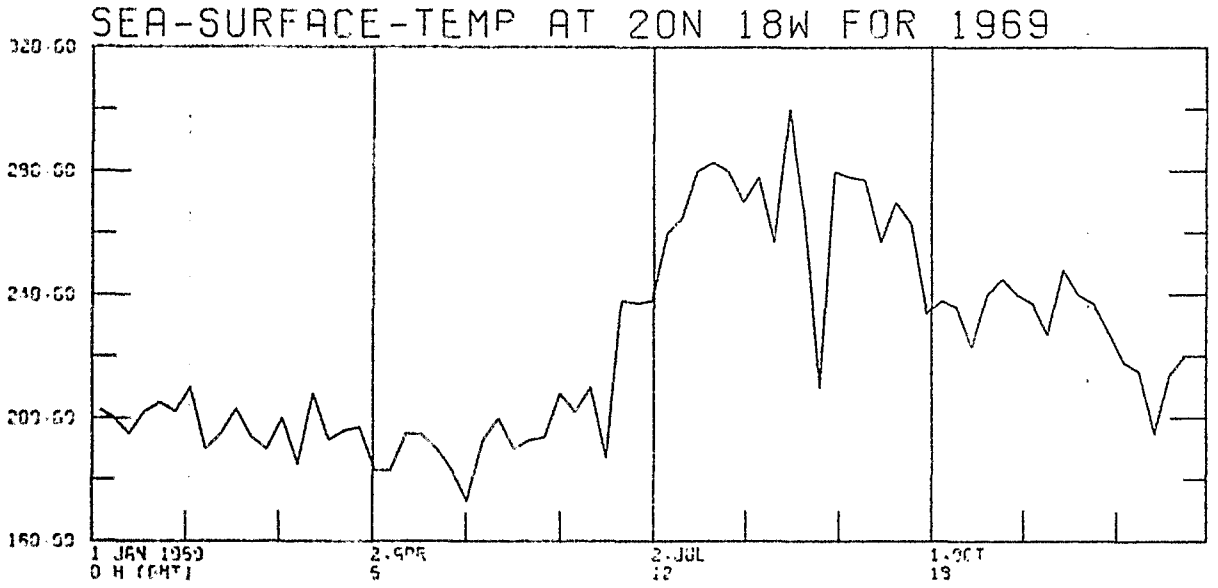

PRESS-DIFF AND OSZ AT J=4 FOR 1969
120.00
80.00
40.00
0.00
-40.00
-120.00
1 JAN 1969
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
18

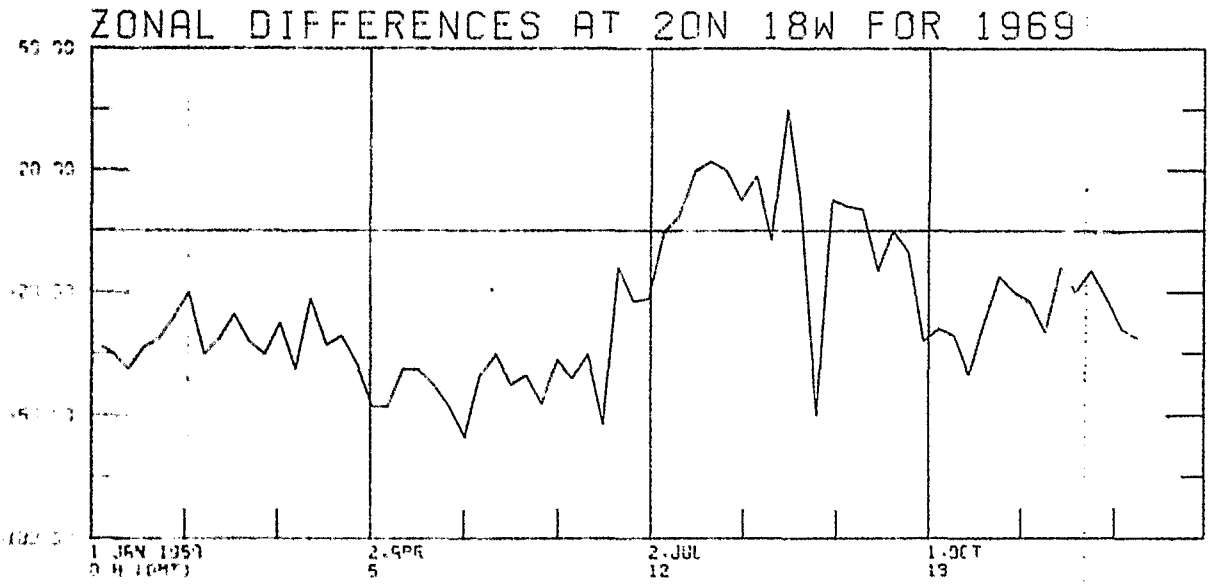

PRESS-DIFF AND OSZ AT J=5 FOR 1969
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1 JAN 1969
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
18

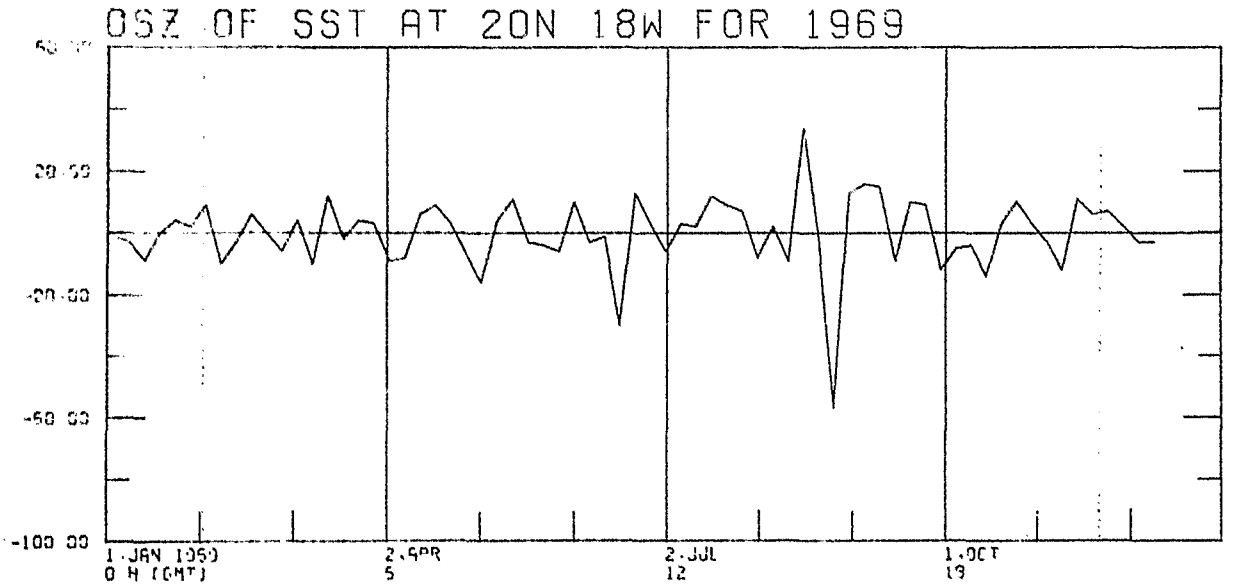

SEA-SURFACE-TEMP AT 16N 18W FOR 1969
320.00
280.00
240.00
200.00
160.00
1.JAN 1969
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

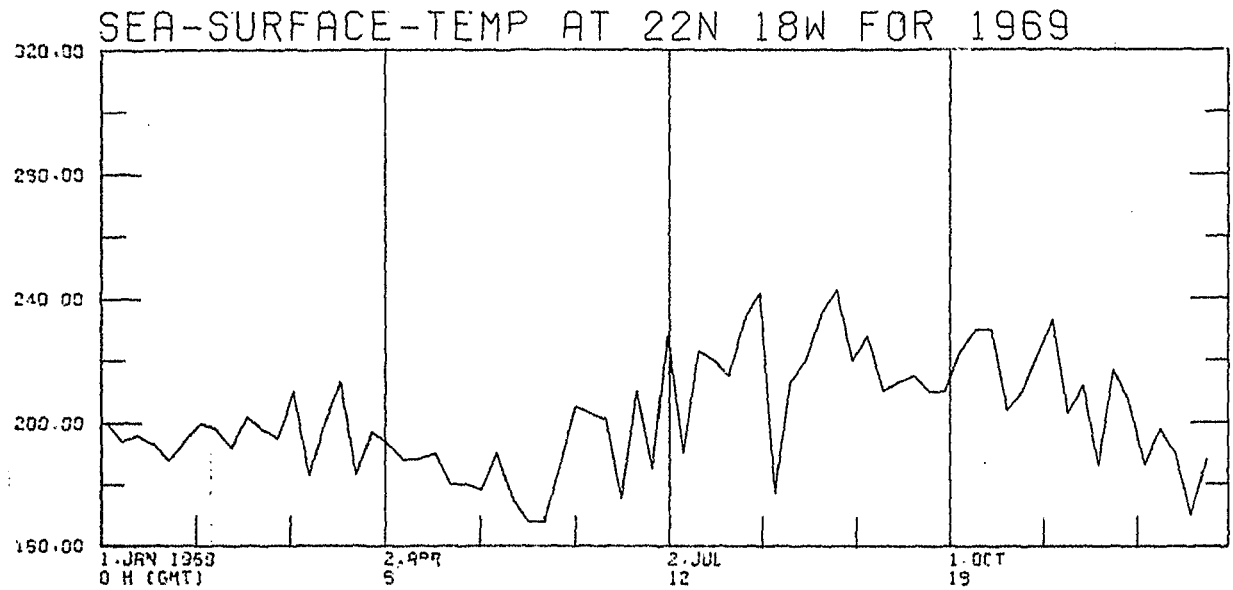

ZONAL DIFFERENCES AT 16N 18W FOR 1969
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1969
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

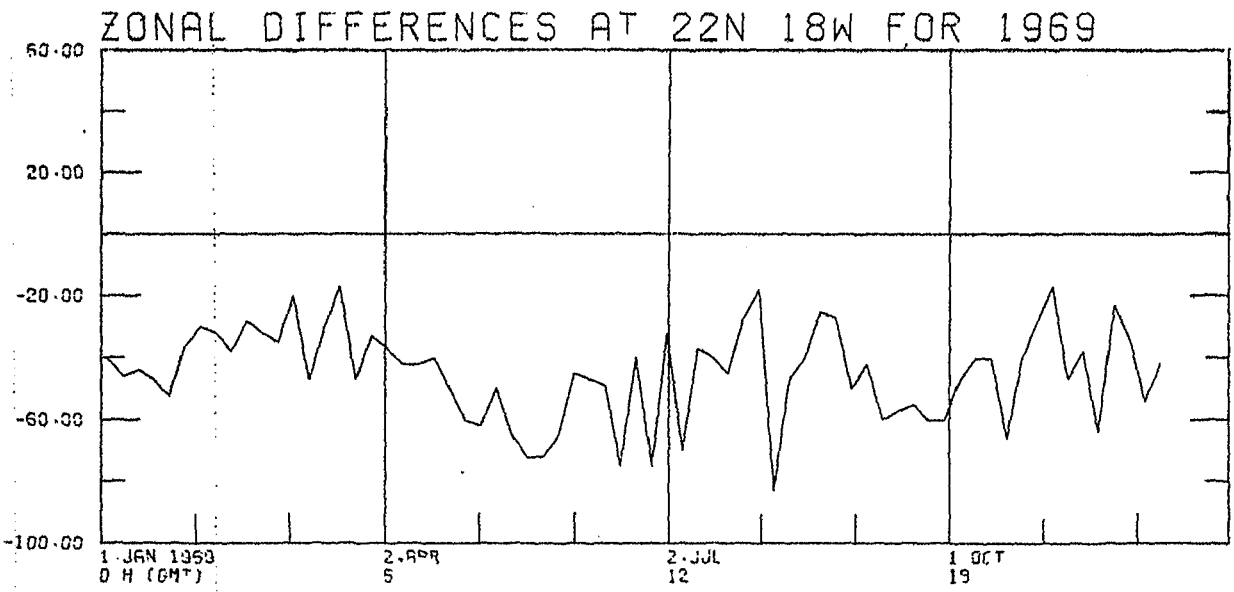

OSZ OF SST AT 16N 18W FOR 1969
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1969
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

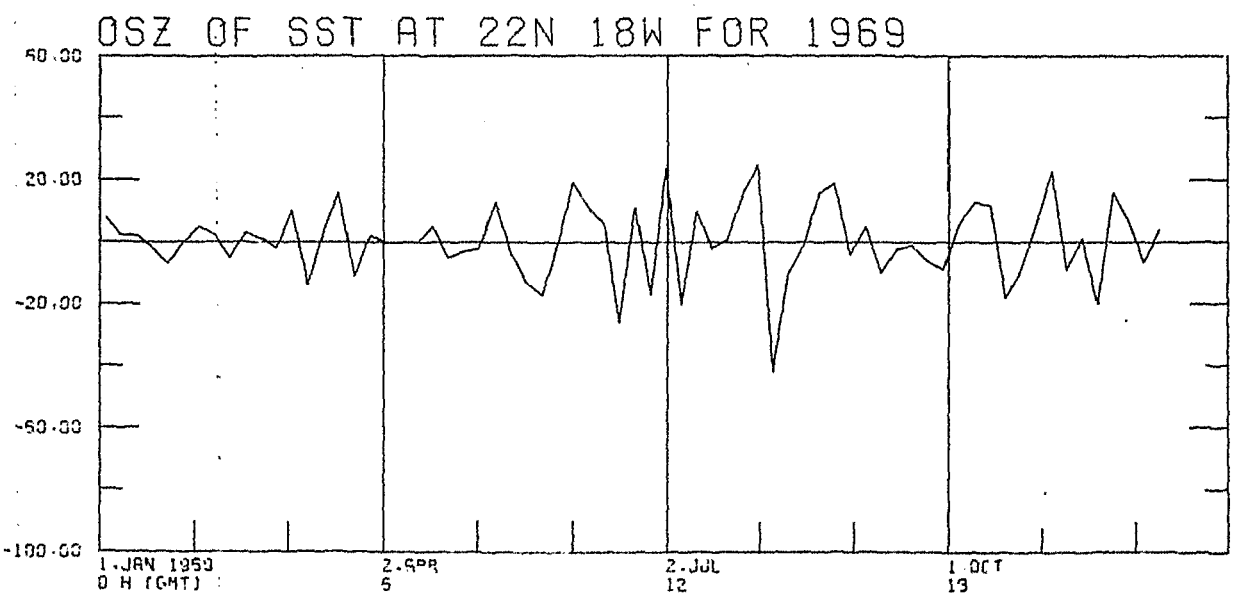

SEA-SURFACE-TEMP AT 20N 18W FOR 1969
320.00
280.00
240.00
200.00
160.00
1 JAN 1969
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

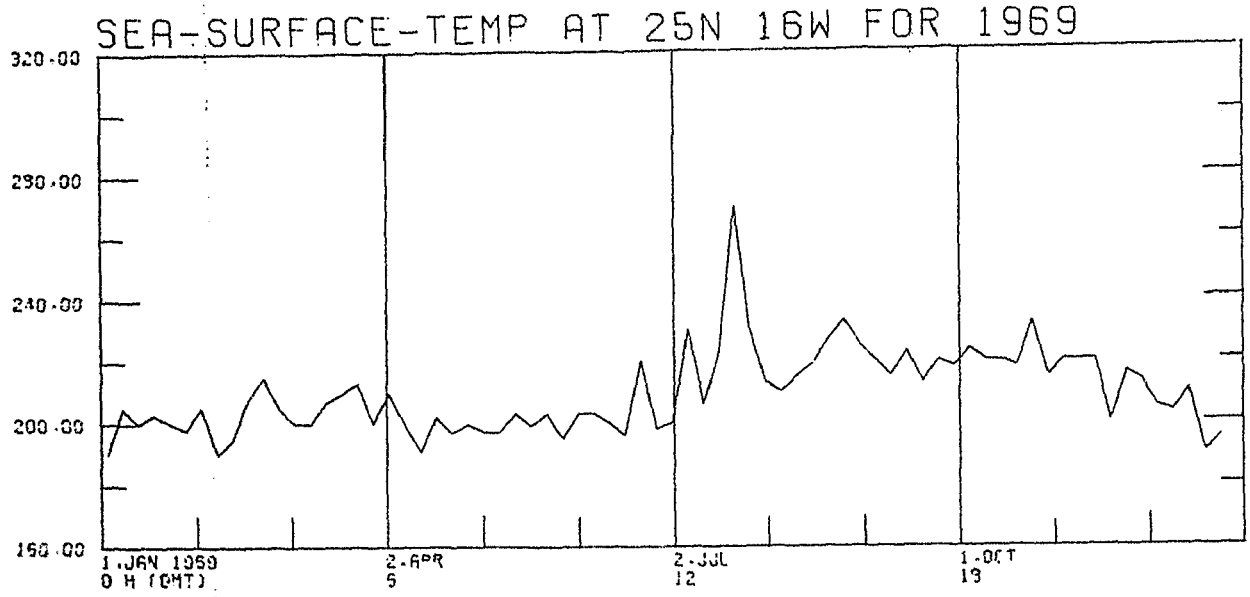

ZONAL DIFFERENCES AT 20N 18W FOR 1969
50.00
20.00
1 JAN 1969
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

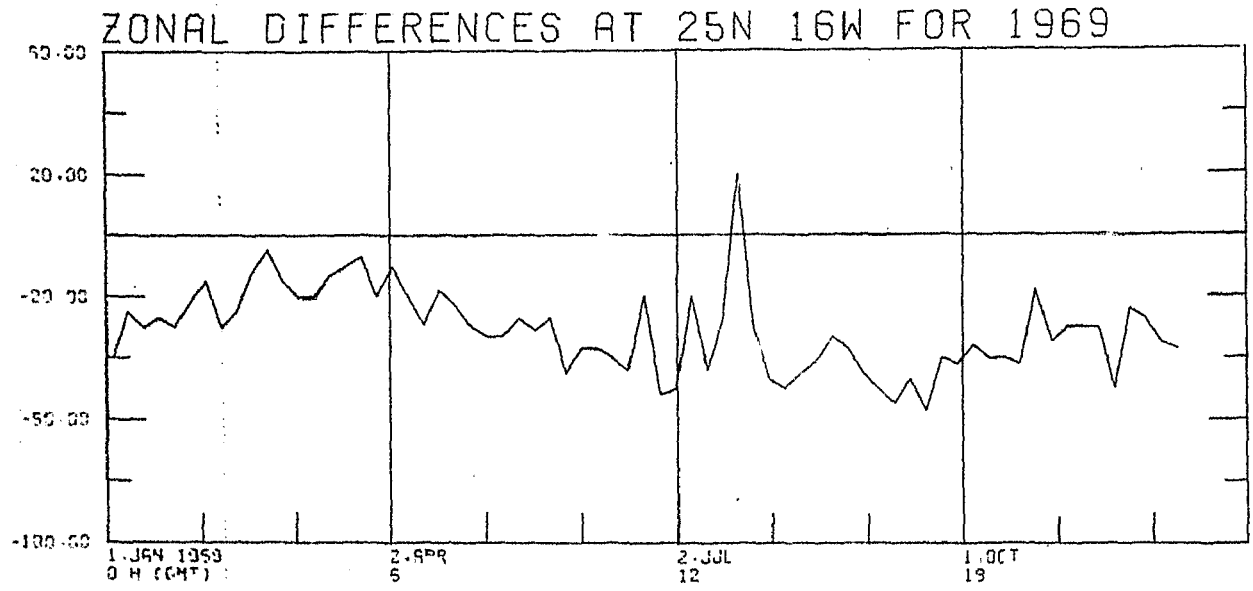

OSZ OF SST AT 20N 18W FOR 1969
20.00
-20.00
-60.00
-100.00
1 JAN 1969
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

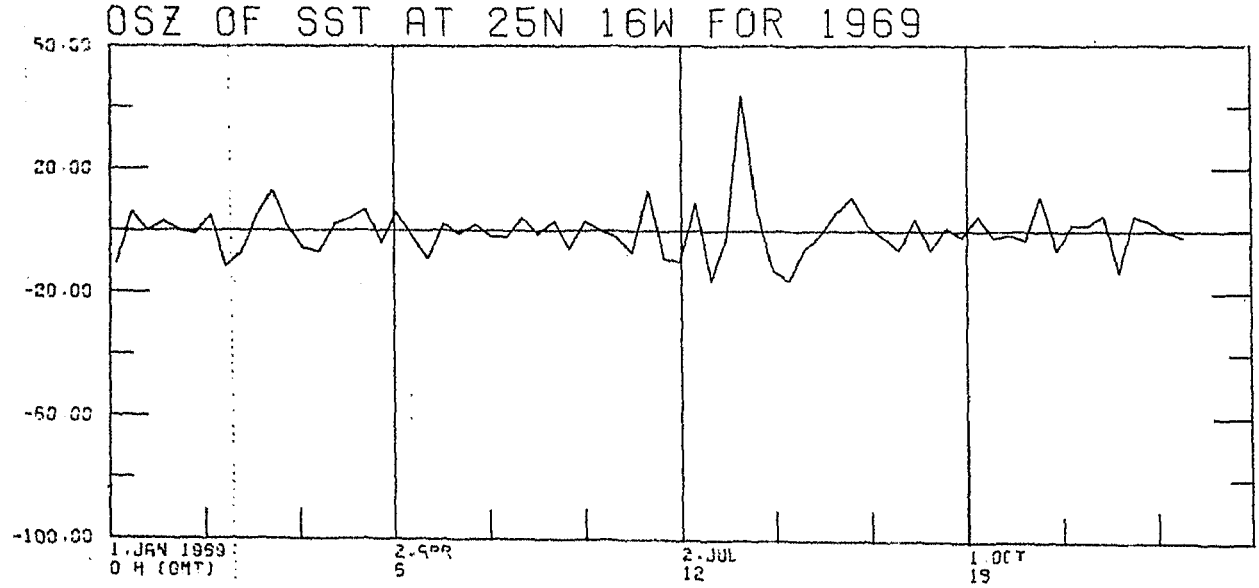

SEA-SURFACE-TEMP AT 22N 18W FOR 1969
320.00
280.00
240.00
200.00
160.00
1.JAN 1969
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
19

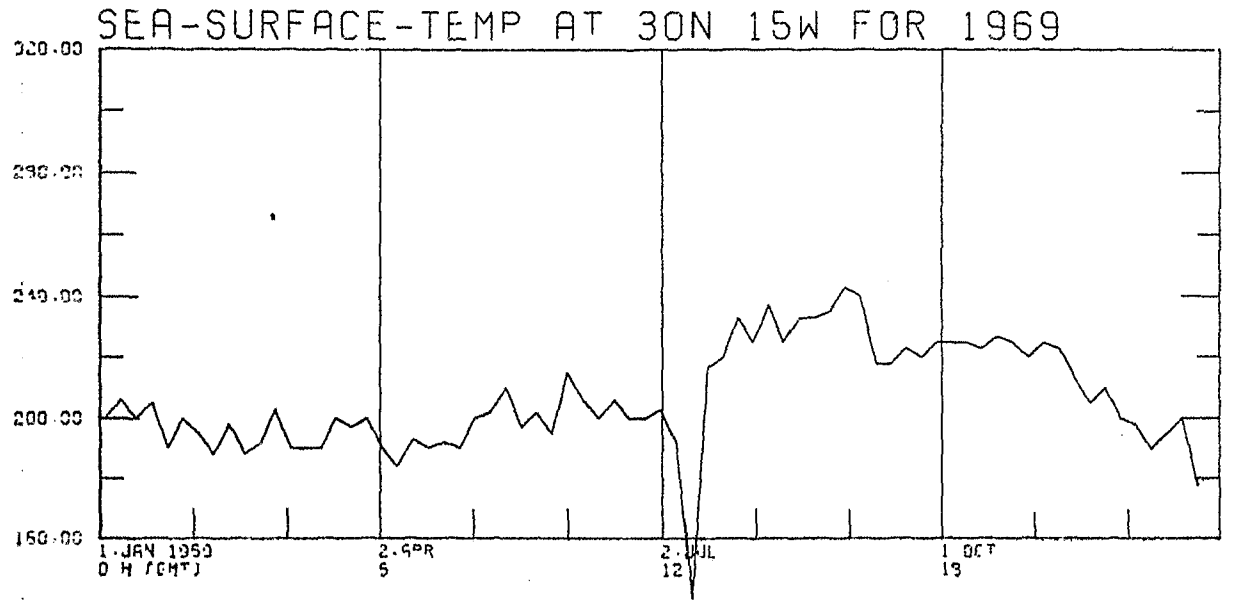

ZONAL DIFFERENCES AT 22N 18W FOR 1969
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1969
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
19

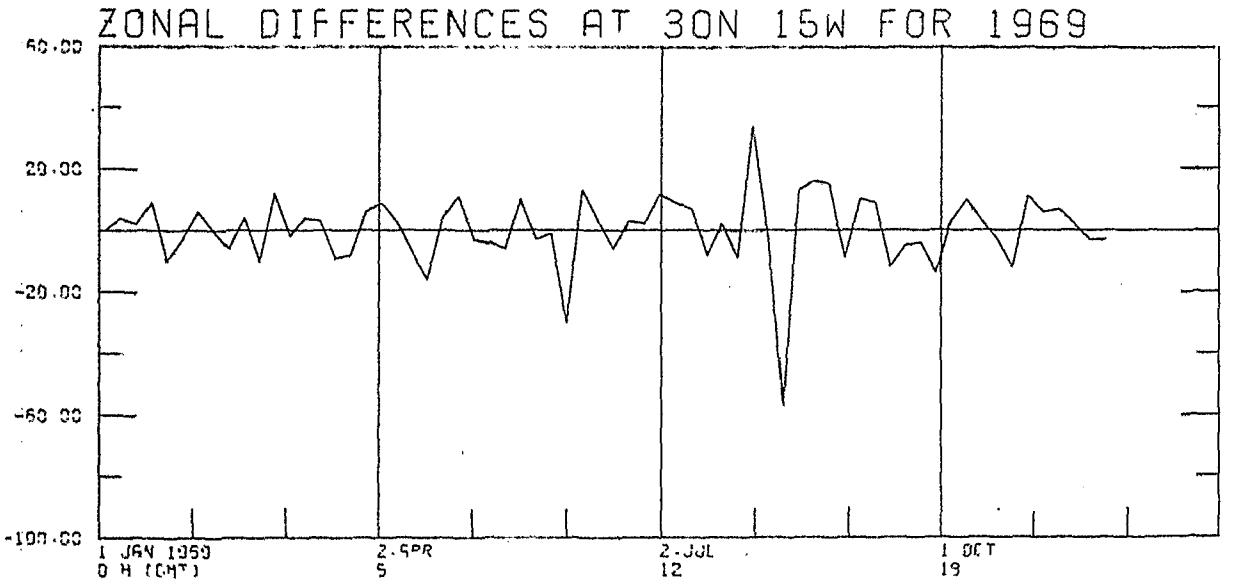

OSZ OF SST AT 22N 18W FOR 1969
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1969
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
19

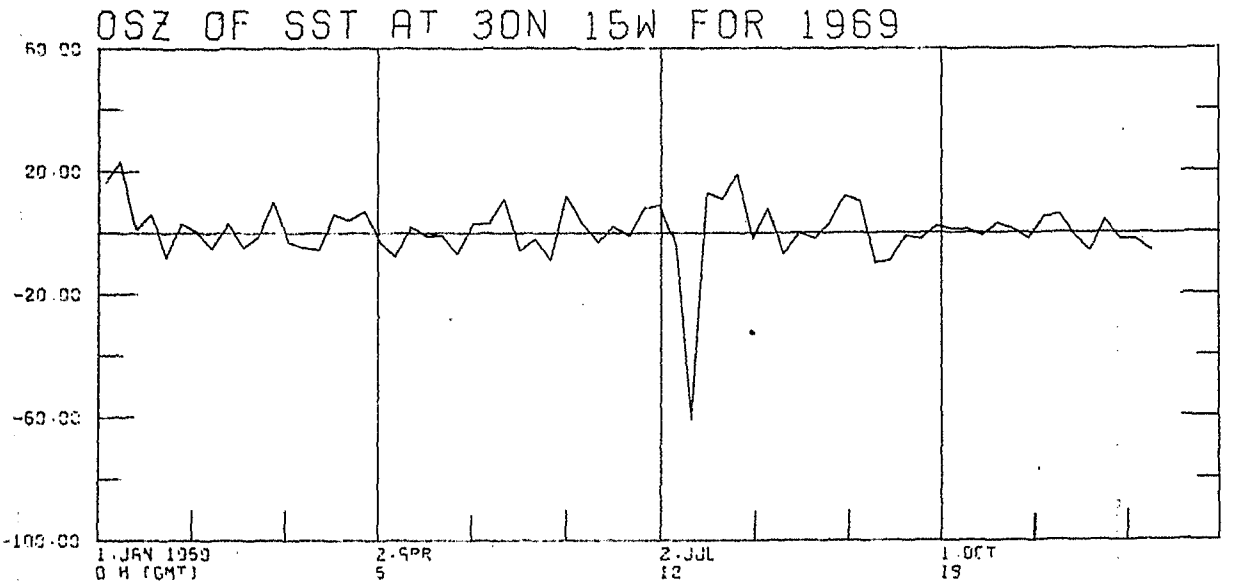

SEA-SURFACE-TEMP AT 25N 16W FOR 1969
320.00
280.00
240.00
200.00
160.00
1 JAN 1969
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
19

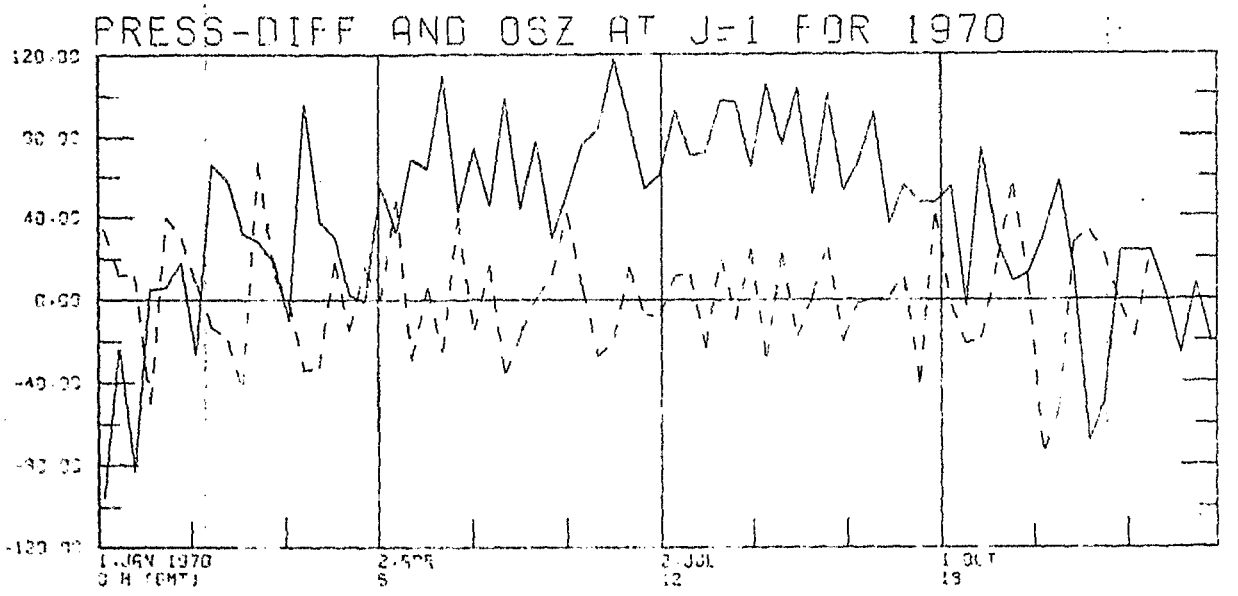

ZONAL DIFFERENCES AT 25N 16W FOR 1969
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1969
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
19

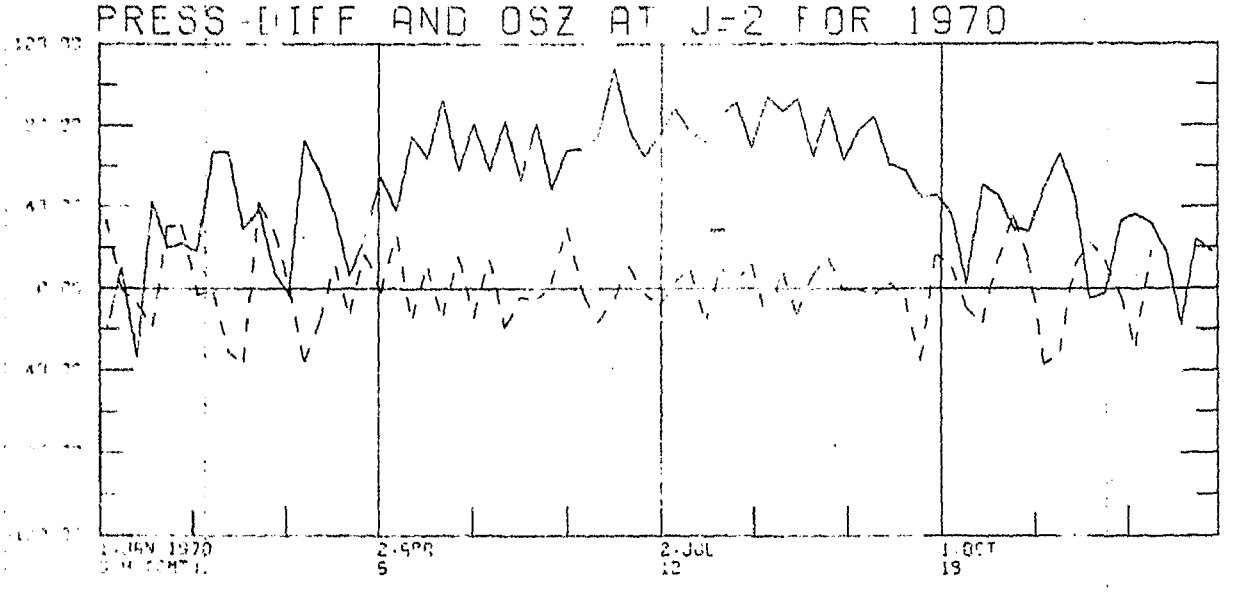

OSZ OF SST AT 25N 16W FOR 1969
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1969
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
19

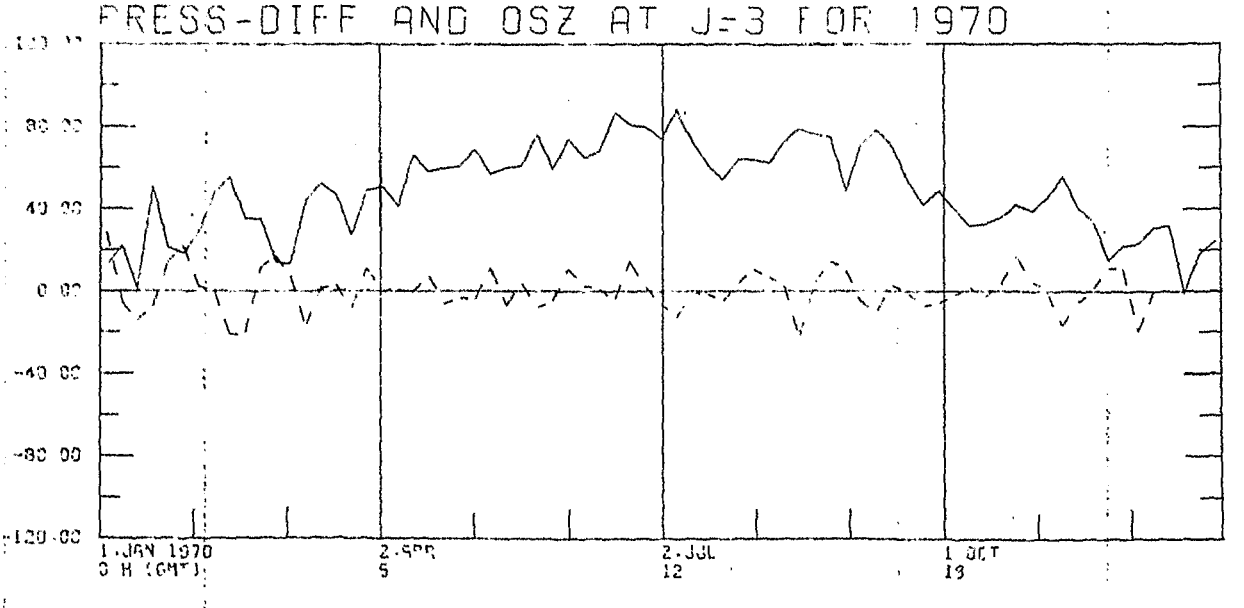

SEA-SURFACE-TEMP AT 30N 15W FOR 1969
320.00
280.00
240.00
200.00
160.00
1 JAN 1969
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

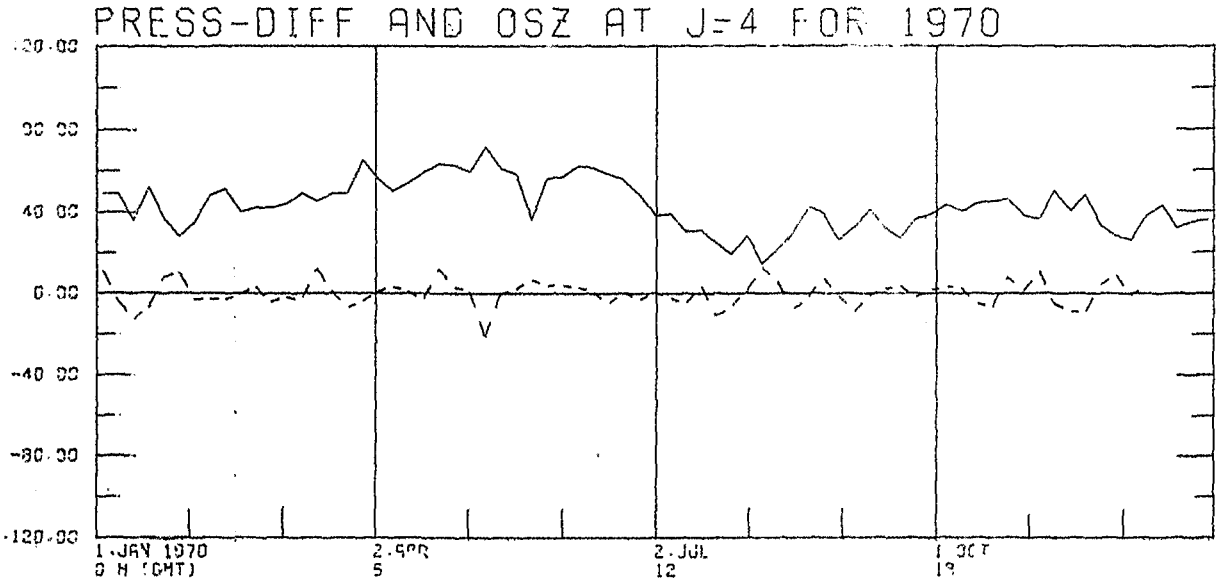

ZONAL DIFFERENCES AT 30N 15W FOR 1969
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1969
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

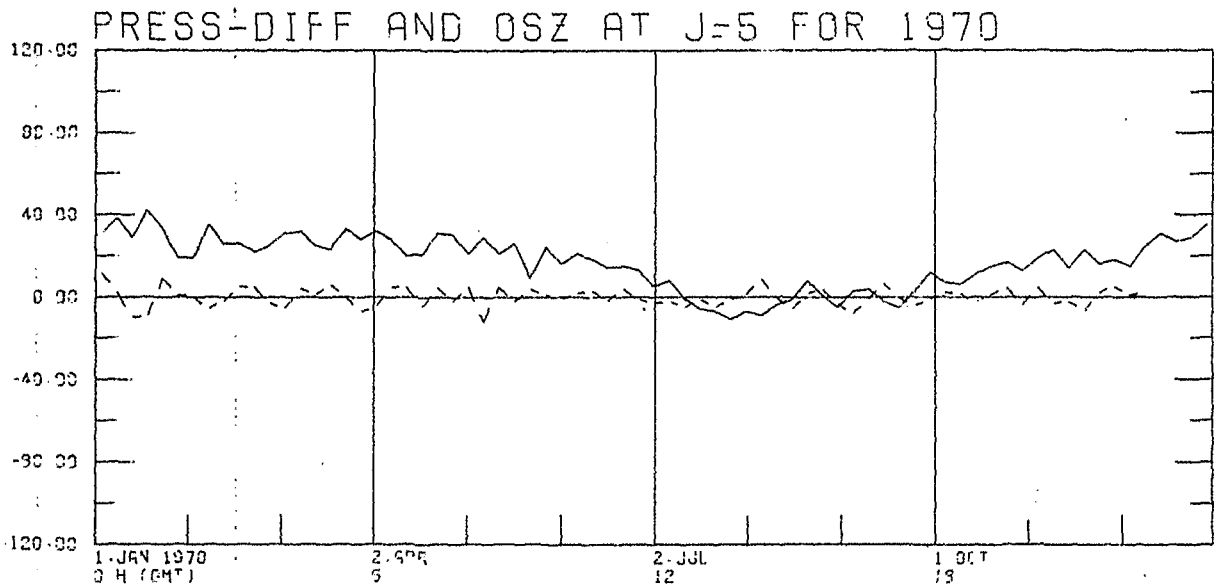

OSZ OF SST AT 30N 15W FOR 1969
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1969
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

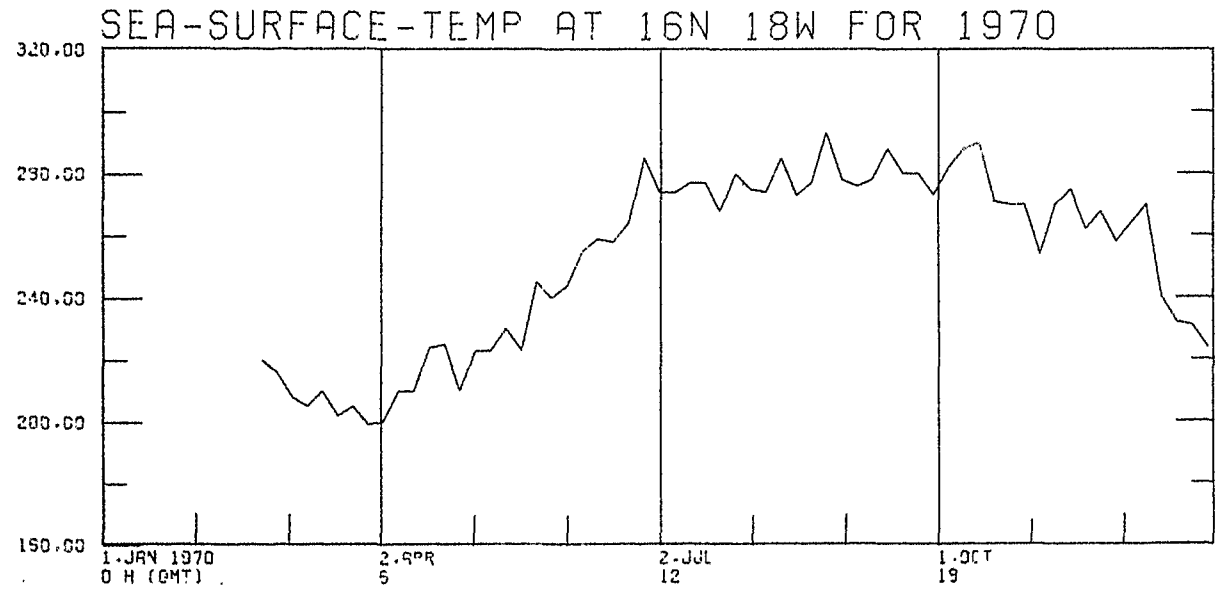

PRESS-DIFF AND OSZ AT J=1 FOR 1970
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1 JAN 1970
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

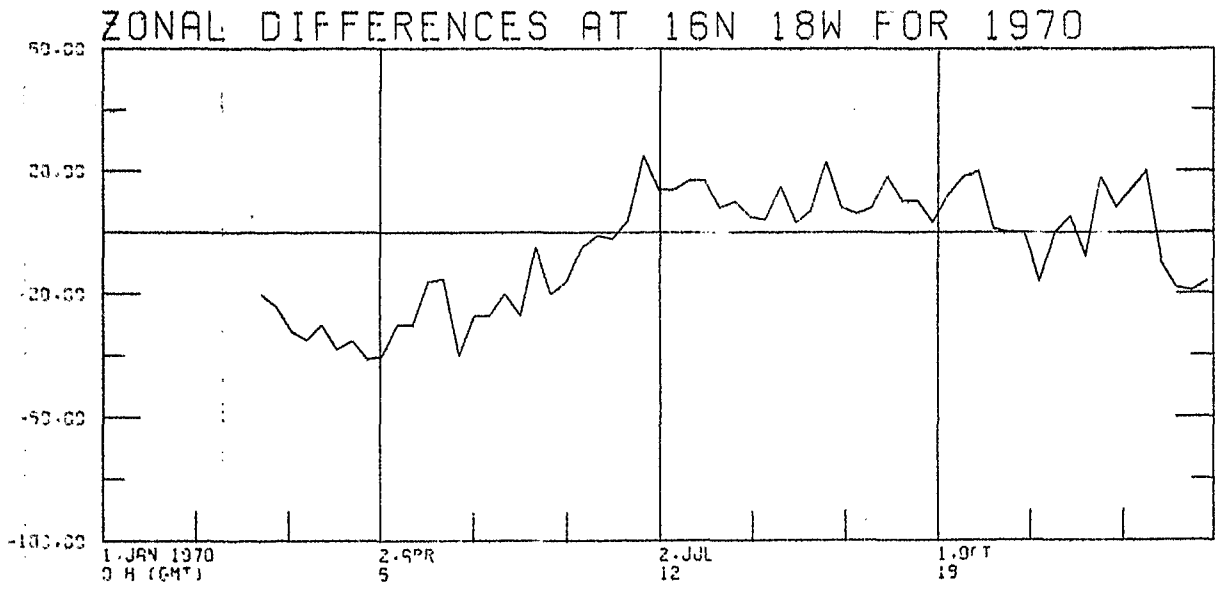

PRESS-DIFF AND OSZ AT J=2 FOR 1970
1 JAN 1970
2 APR
5
2 JUL
12
1 OCT
19

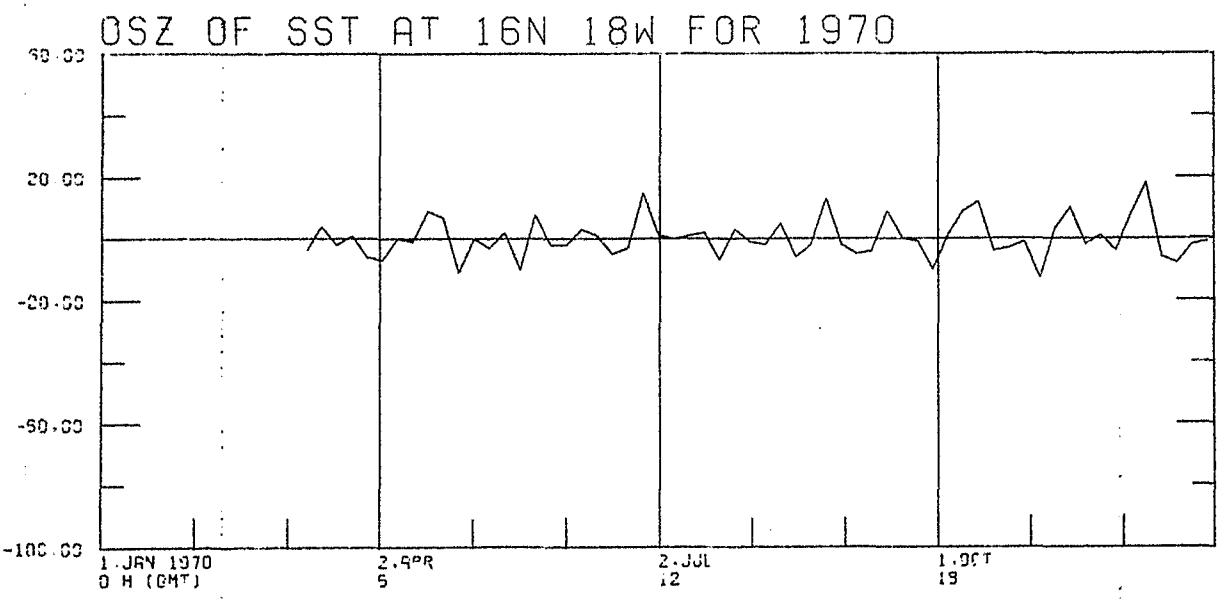

PRESS-DIFF AND OSZ AT J=3 FOR 1970
80.00
40.00
0.00
-40.00
-80.00
-120.00
1 JAN 1970
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

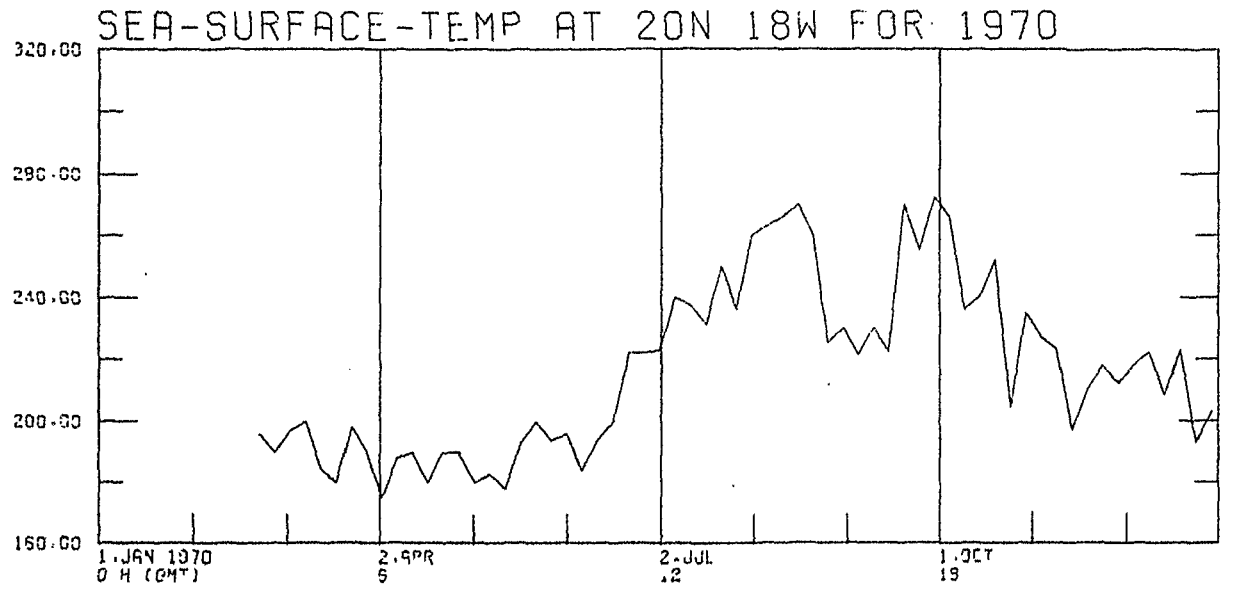

PRESS-DIFF AND OSZ AT J=4 FOR 1970
80.00
40.00
0.00
-40.00
-80.00
-120.00
1 JAN 1970
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

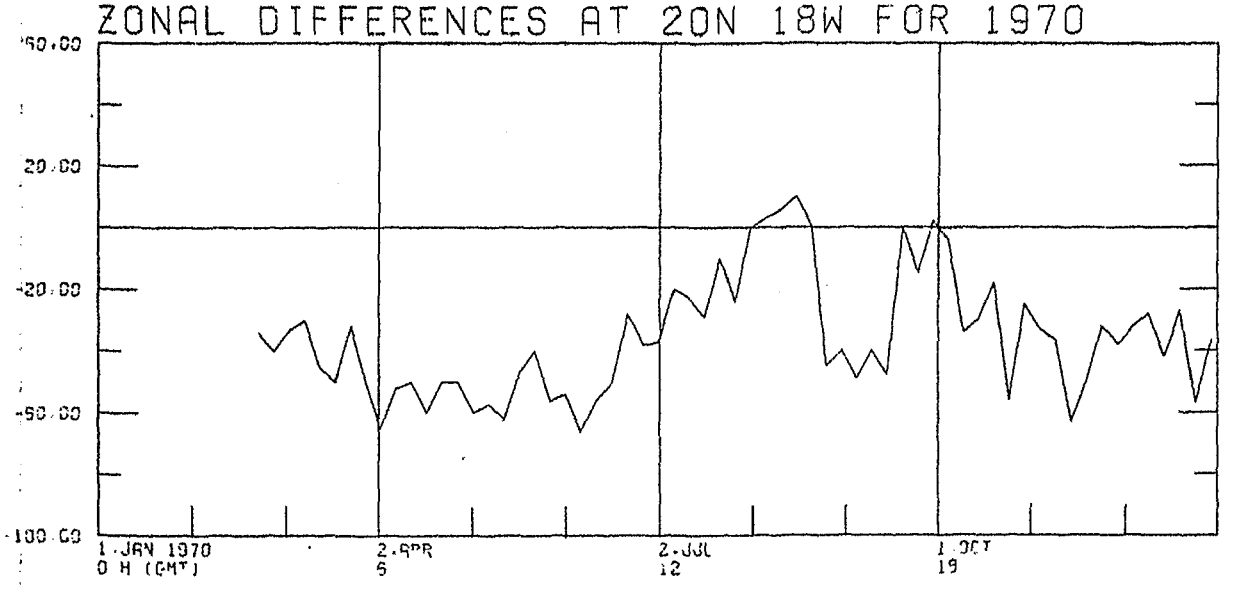

PRESS-DIFF AND OSZ AT J=5 FOR 1970
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1 JAN 1970
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

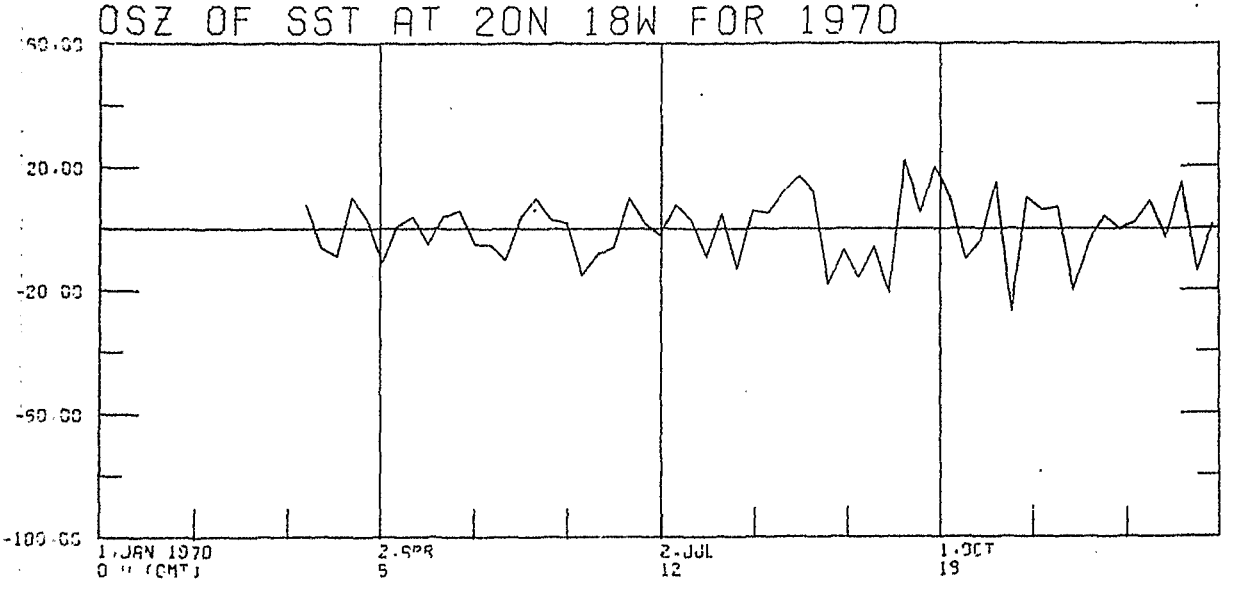

SEA-SURFACE-TEMP AT 16N 18W FOR 1970
320.00
280.00
240.00
200.00
160.00
1 JAN 1970
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
19

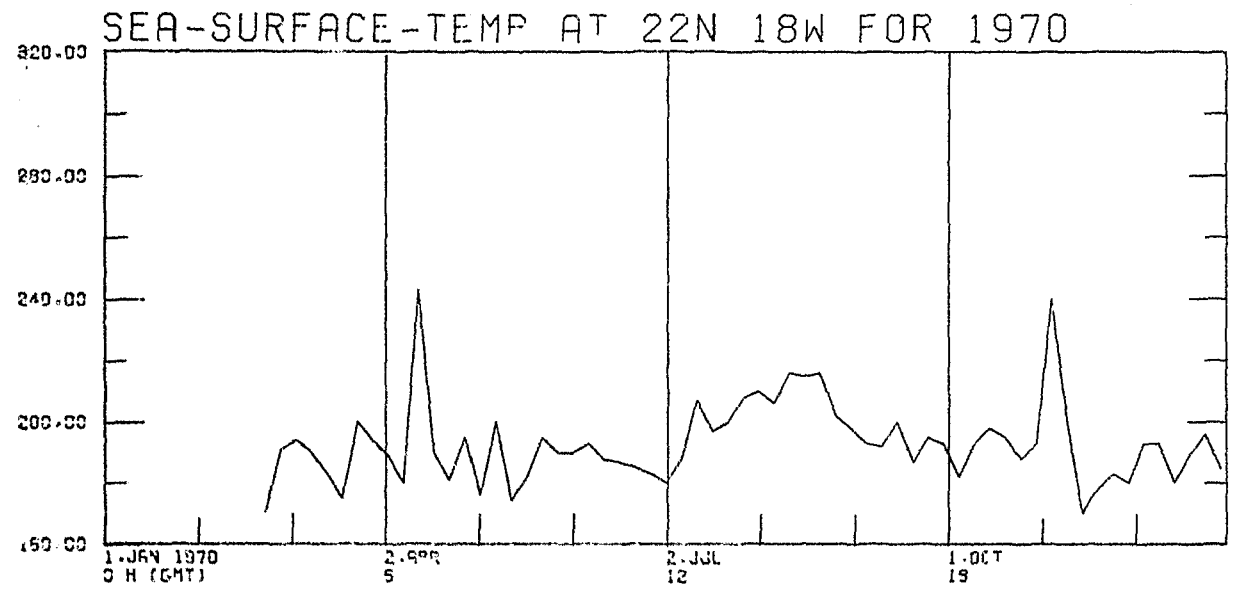

ZONAL DIFFERENCES AT 16N 18W FOR 1970
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1970
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
19

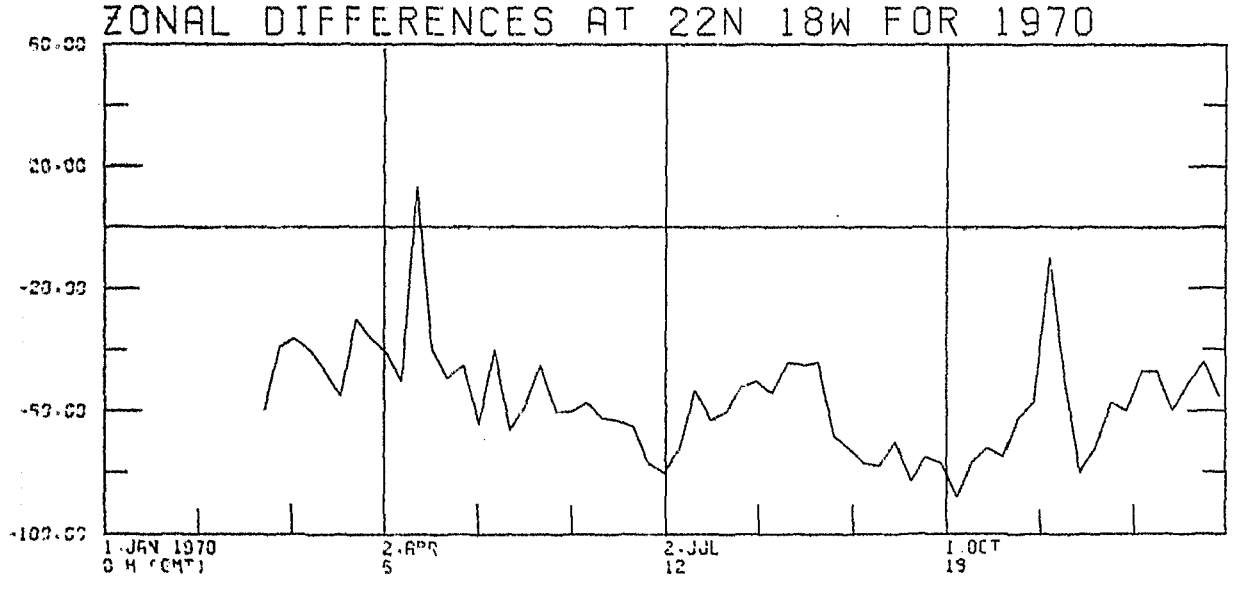

OSZ OF SST AT 16N 18W FOR 1970
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1970
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
19

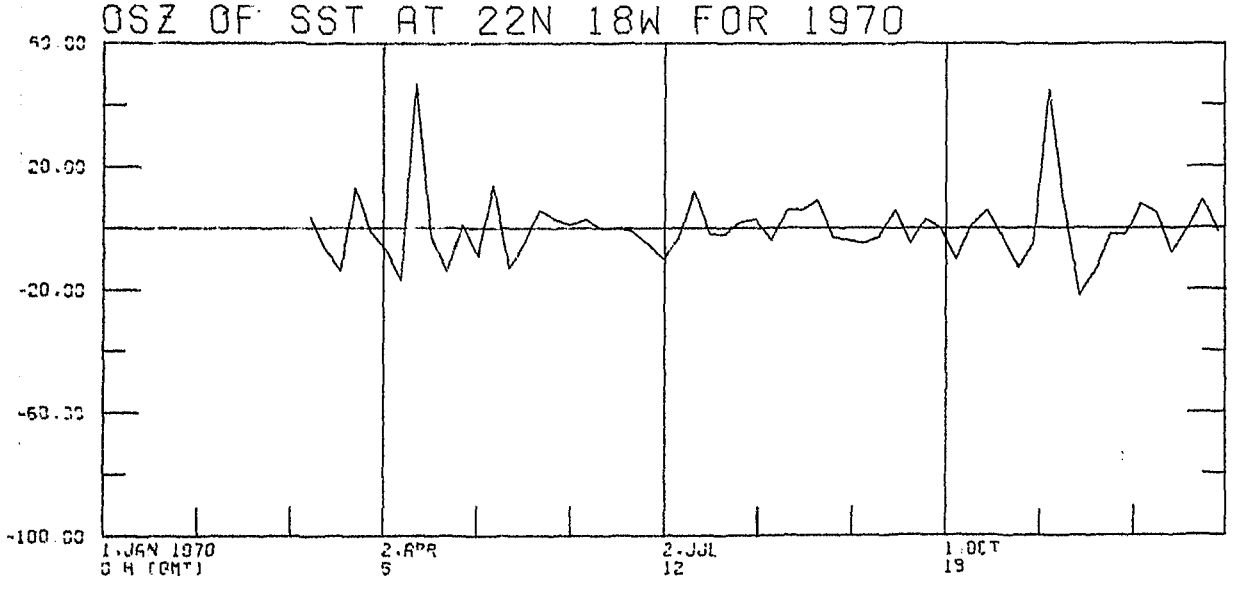

SEA-SURFACE-TEMP AT 20N 18W FOR 1970
320.00
280.00
240.00
200.00
160.00
1.JAN 1970
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

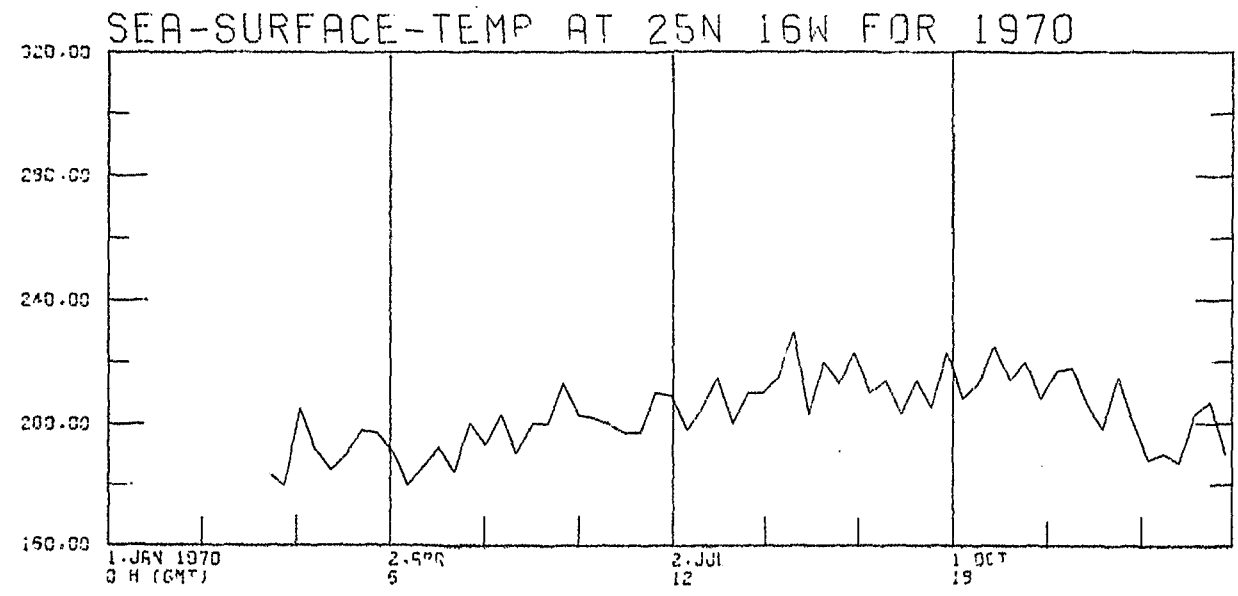

ZONAL DIFFERENCES AT 20N 18W FOR 1970
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1970
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

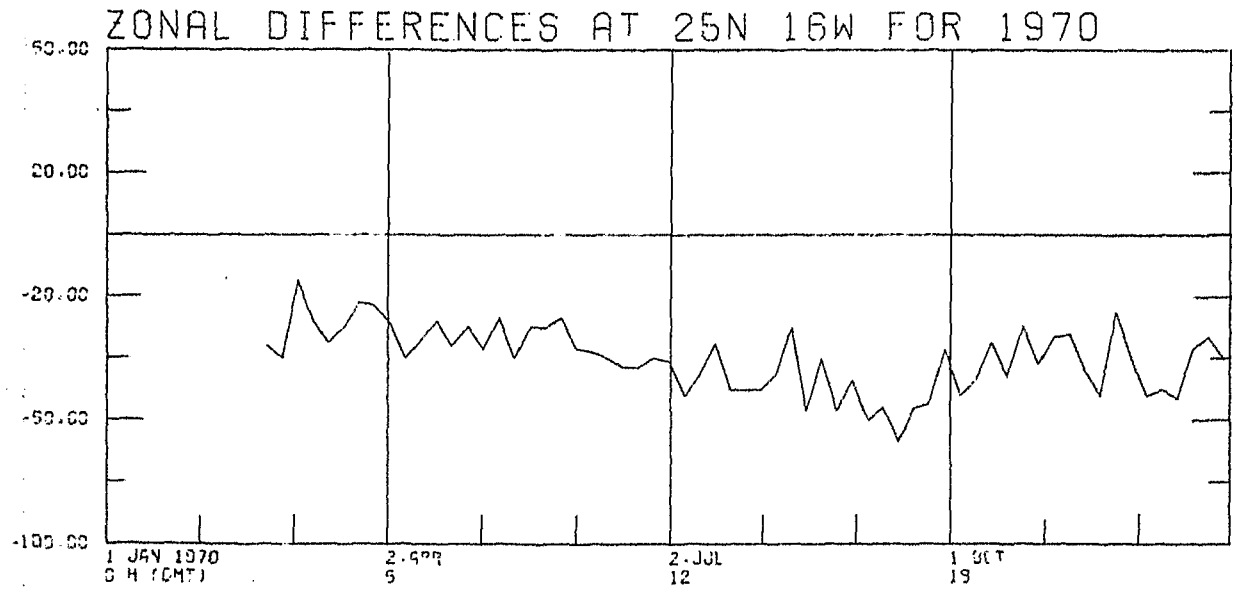

OSZ OF SST AT 20N 18W FOR 1970
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1970
2.APR
6
2.JUL
12
1.OCT
18

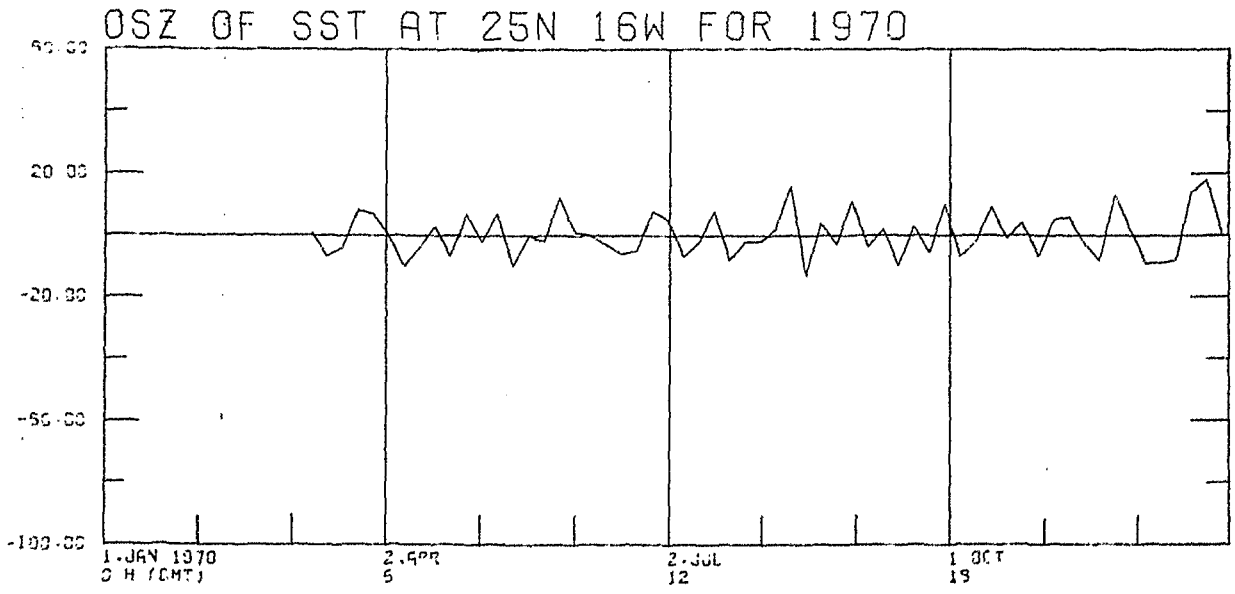

SEA-SURFACE-TEMP AT 22N 18W FOR 1970
320.00
280.00
240.00
200.00
160.00
1 JAN 1970
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

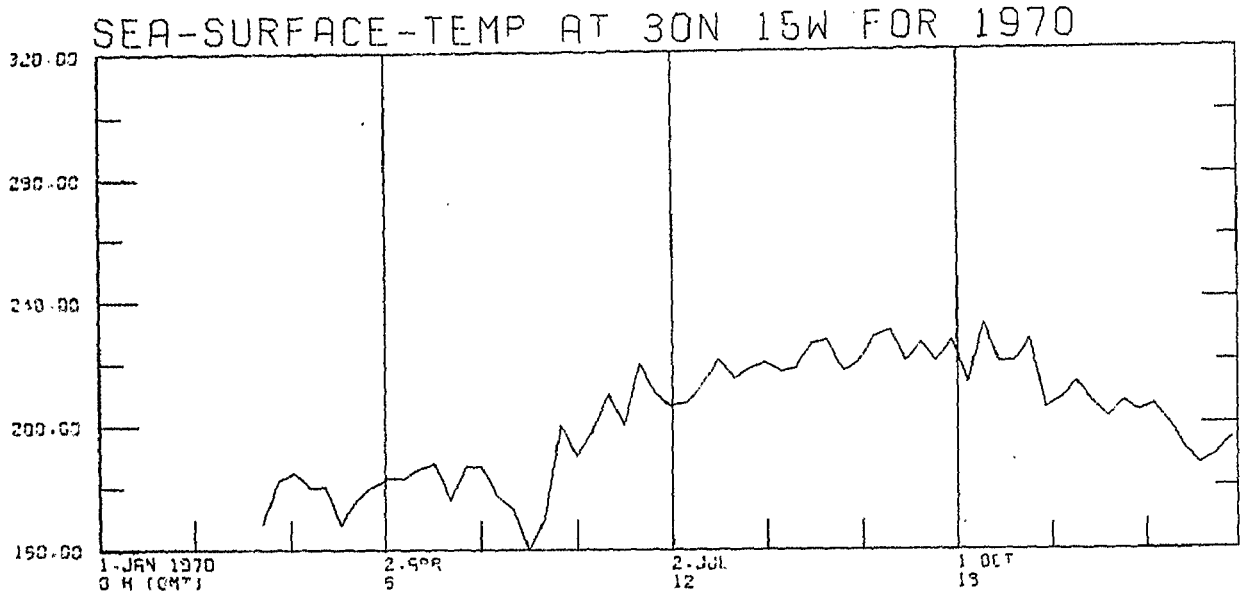

ZONAL DIFFERENCES AT 22N 18W FOR 1970
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1970
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

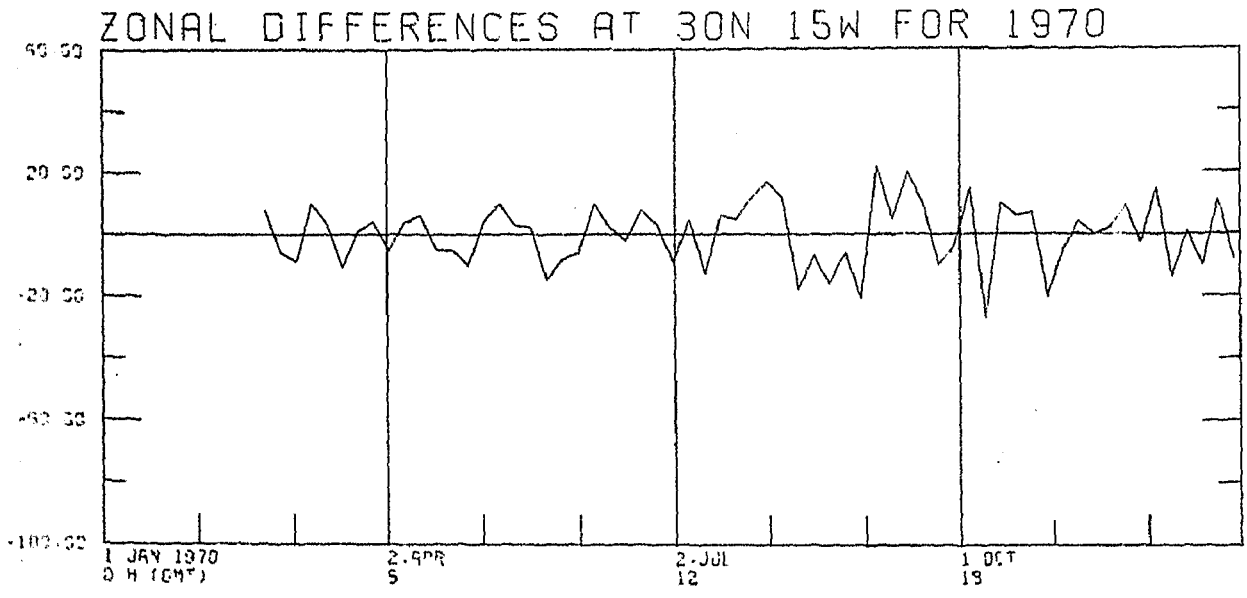

OSZ OF SST AT 22N 18W FOR 1970
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1970
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

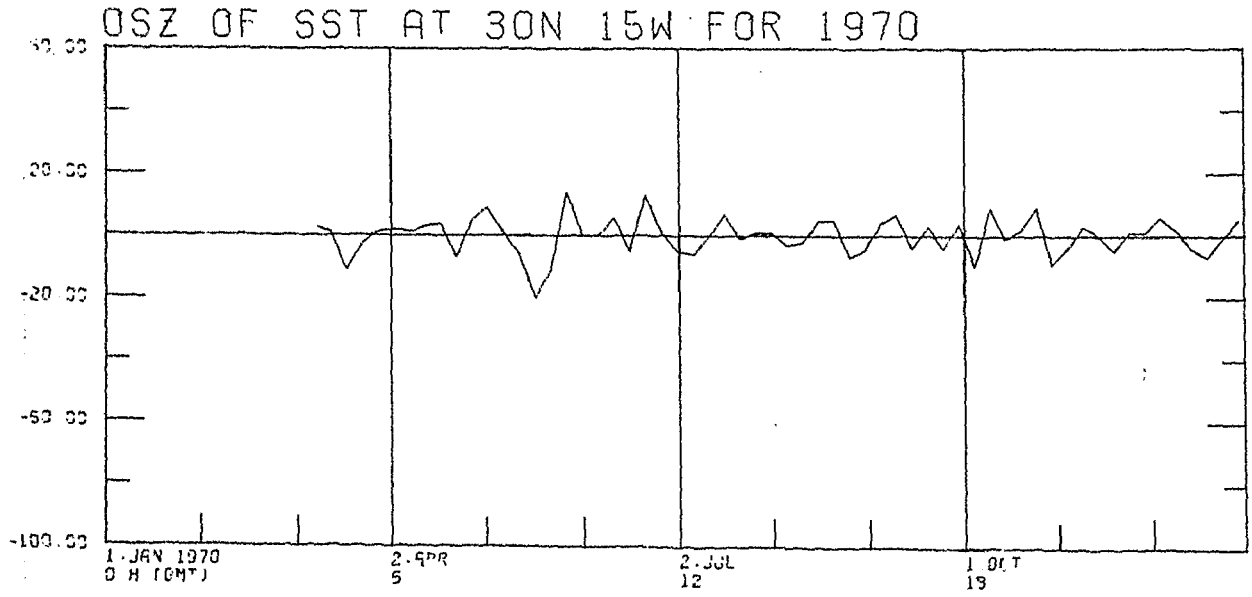

SEA-SURFACE-TEMP AT 25N 16W FOR 1970
320.00
280.00
240.00
200.00
160.00
1.JAN 1970
0 H (GMT)
2.APR
6
2.JUL
12
1 OCT
18

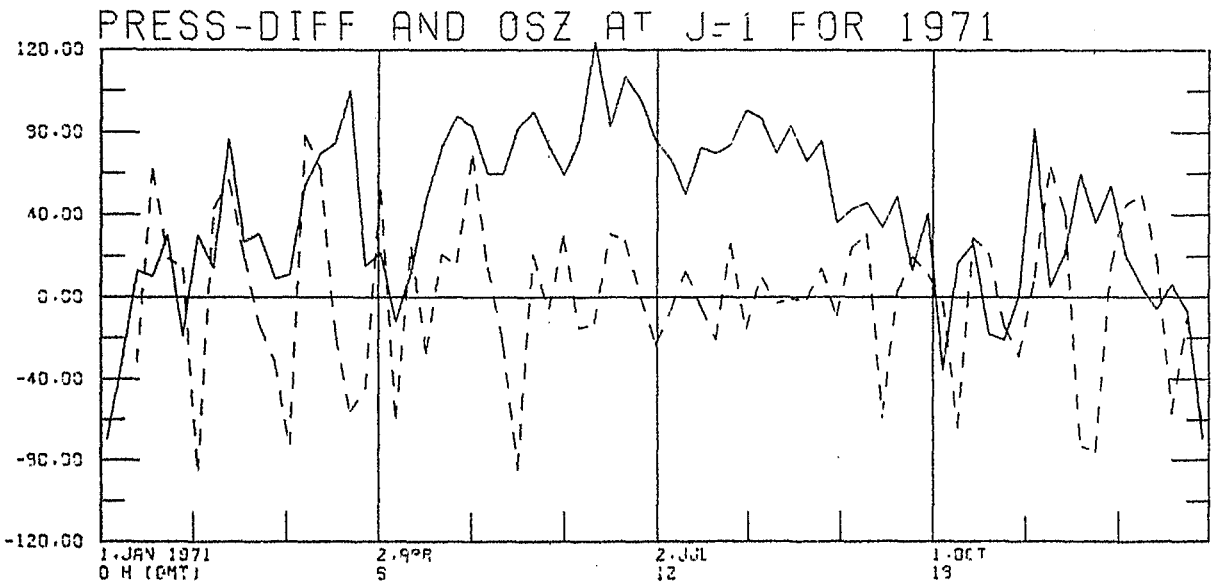

ZONAL DIFFERENCES AT 25N 16W FOR 1970
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1970
0 H (GMT)
2.APR
6
2.JUL
12
1 OCT
18

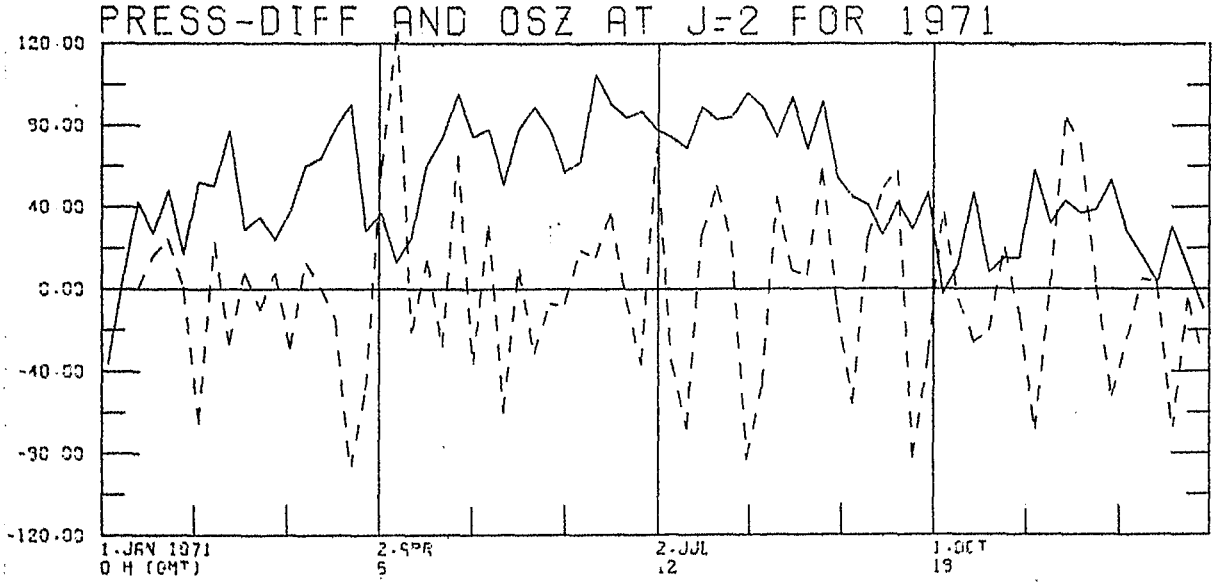

OSZ OF SST AT 25N 16W FOR 1970
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1970
0 H (GMT)
2.APR
6
2.JUL
12
1 OCT
18

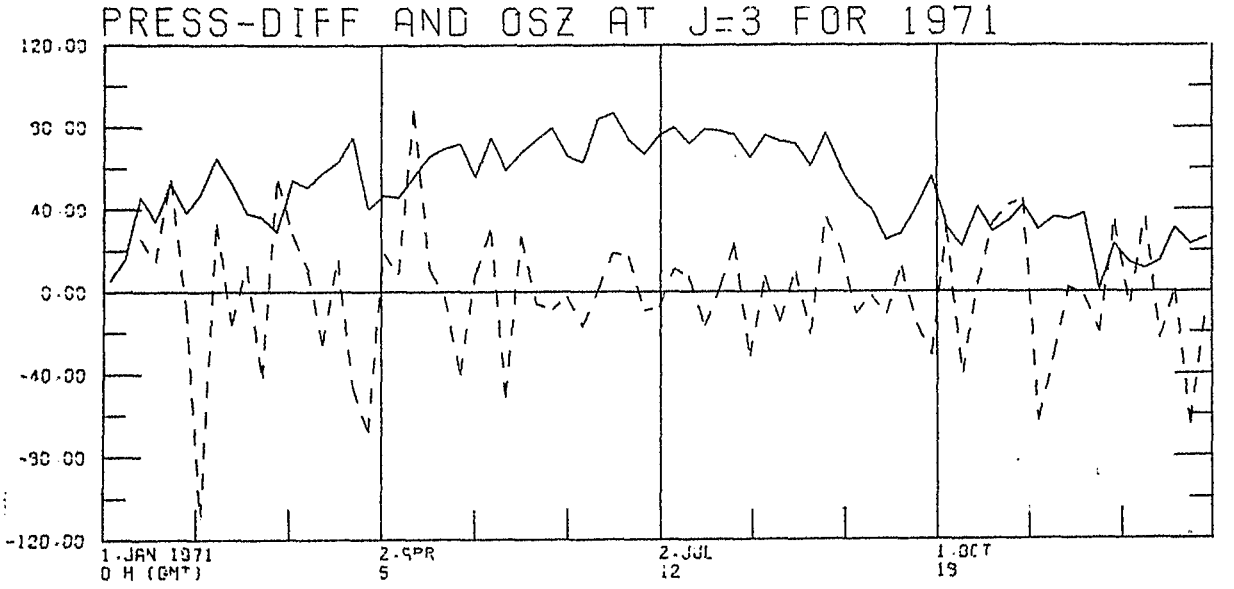

SEA-SURFACE-TEMP AT 30N 15W FOR 1970
320.00
280.00
240.00
200.00
160.00
1 JAN 1970
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

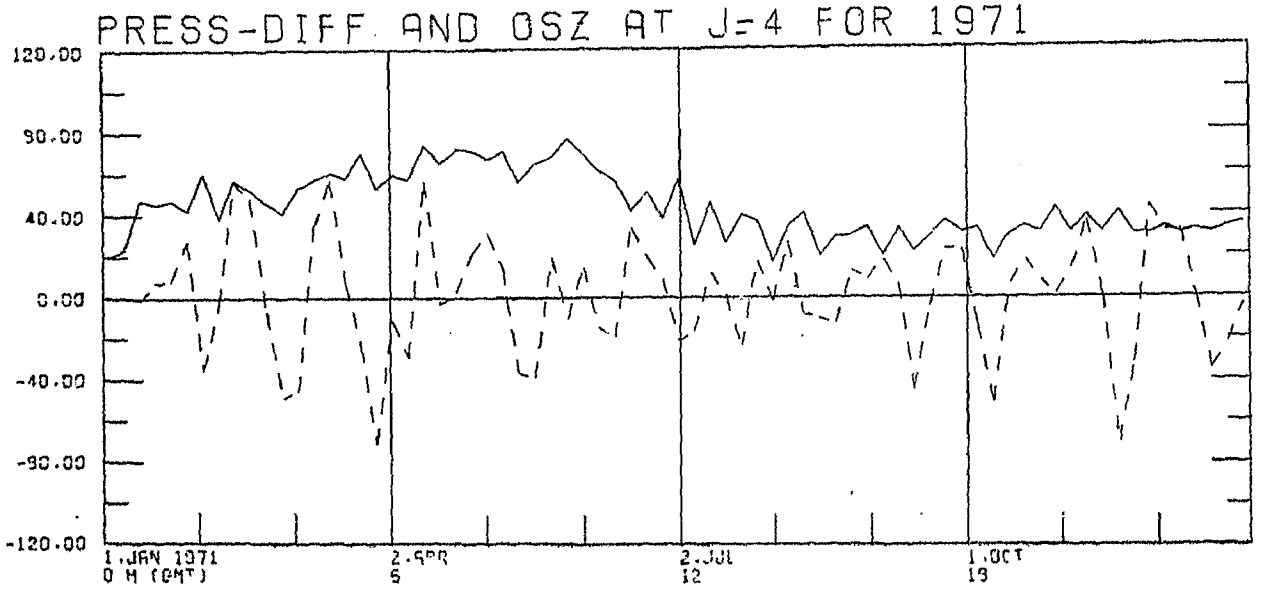

ZONAL DIFFERENCES AT 30N 15W FOR 1970
40.00
20.00
-20.00
-60.00
-100.00
1 JAN 1970
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

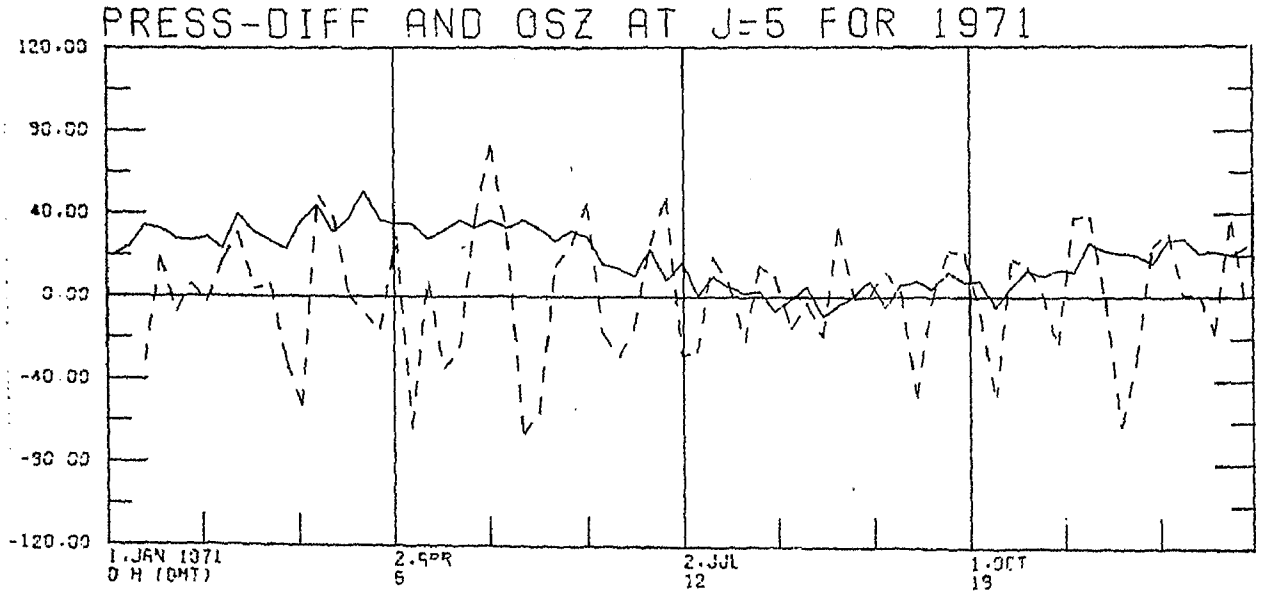

OSZ OF SST AT 30N 15W FOR 1970
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1970
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

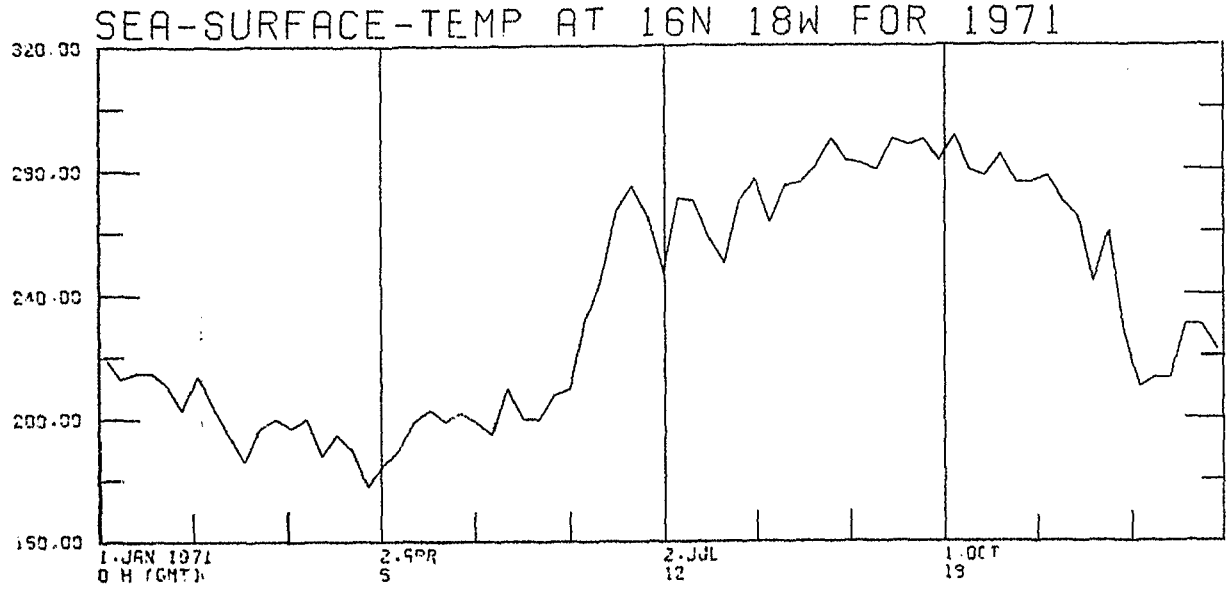

PRESS-DIFF AND OSZ AT J=1 FOR 1971
120.00
90.00
40.00
0.00
-40.00
-90.00
-120.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
19

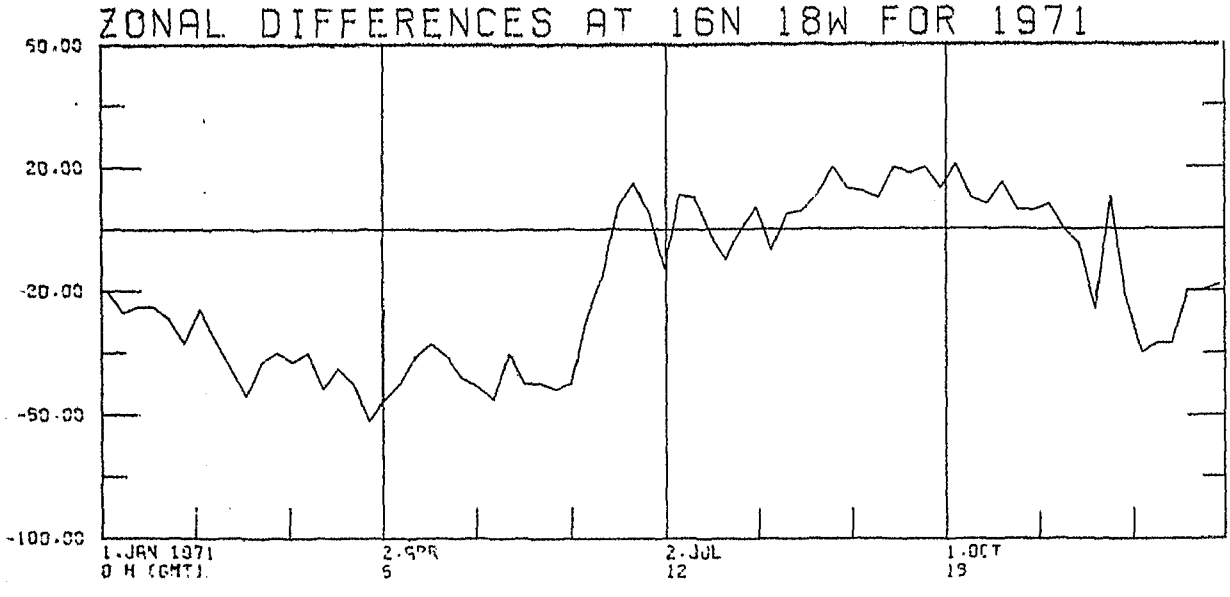

PRESS-DIFF AND OSZ AT J=2 FOR 1971
120.00
90.00
40.00
0.00
-40.00
-90.00
-120.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
19

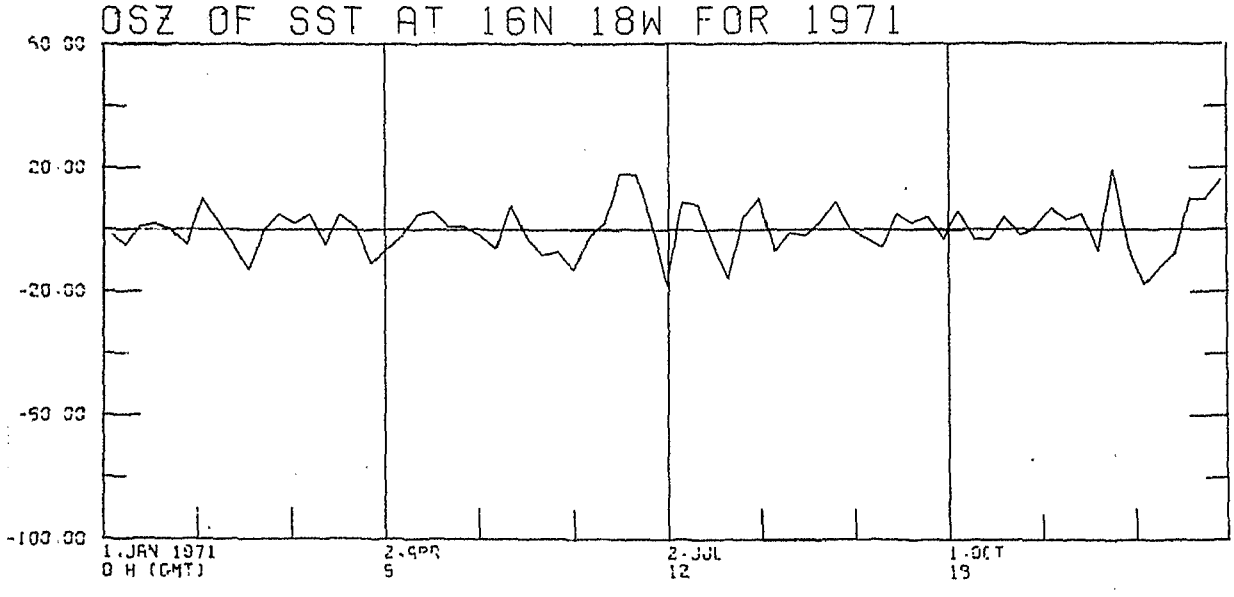

PRESS-DIFF AND OSZ AT J=3 FOR 1971
120.00
90.00
40.00
0.00
-40.00
-90.00
-120.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
19

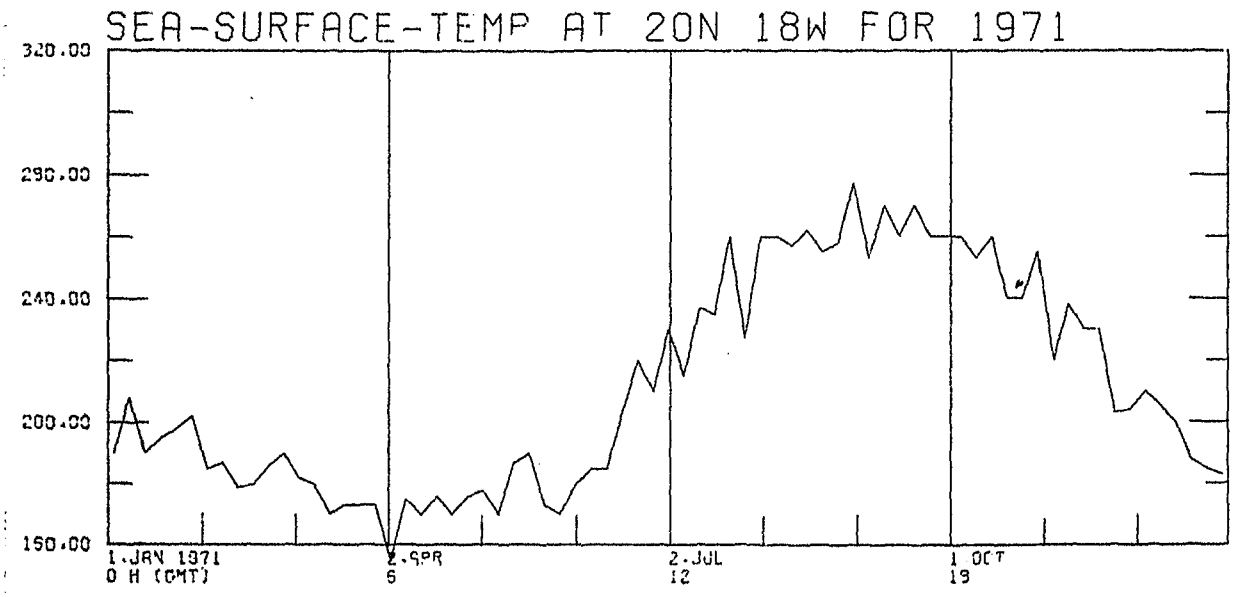

PRESS-DIFF AND OSZ AT J=4 FOR 1971
120.00
90.00
40.00
0.00
-40.00
-80.00
-120.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

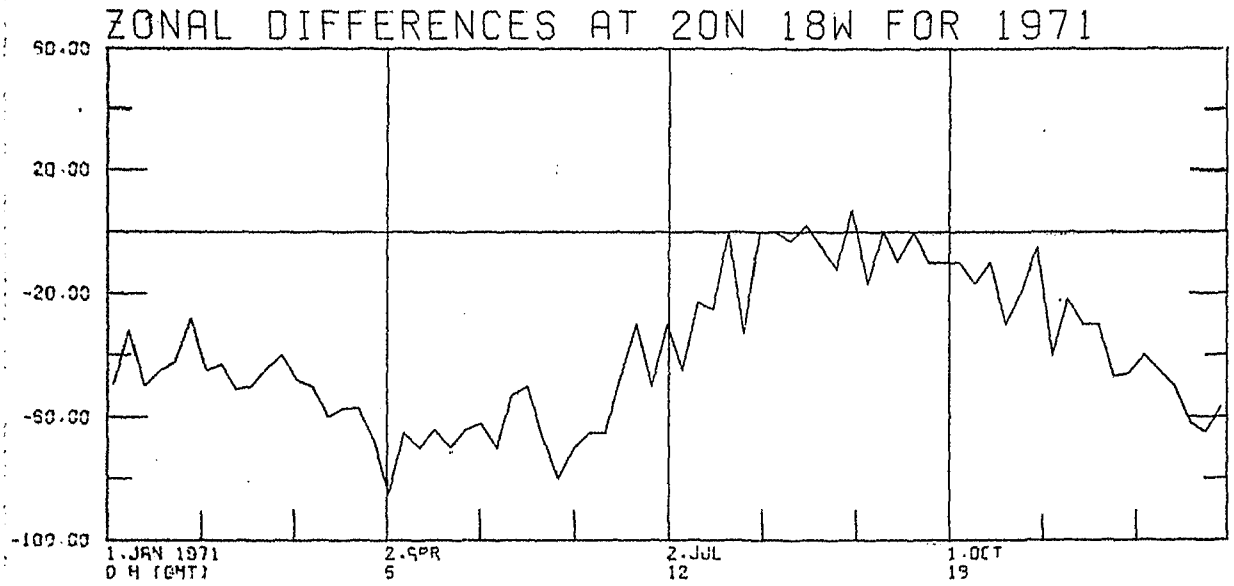

PRESS-DIFF AND OSZ AT J=5 FOR 1971
120.00
90.00
40.00
0.00
-40.00
-80.00
-120.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

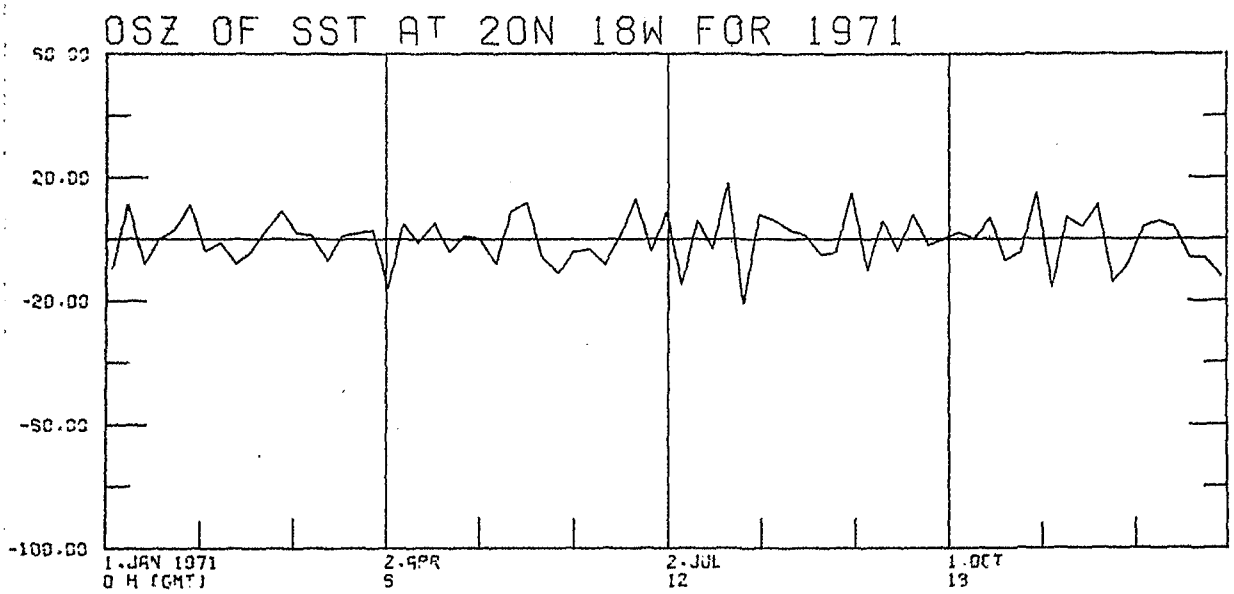

SEA-SURFACE-TEMP AT 16N 18W FOR 1971
320.00
280.00
240.00
200.00
160.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

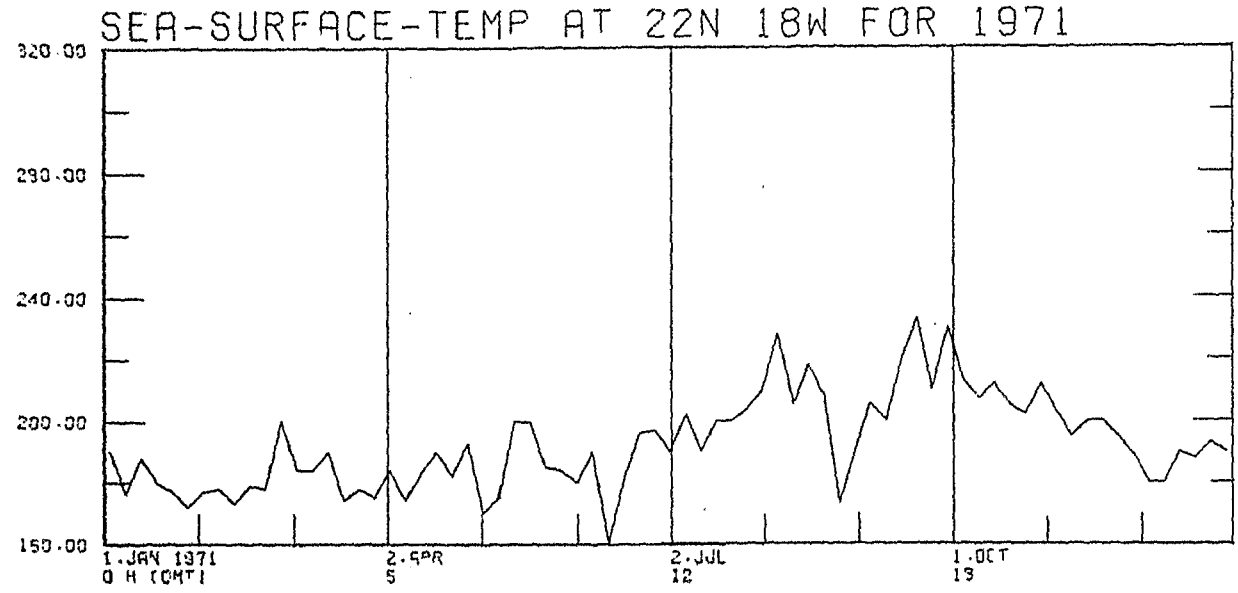

ZONAL DIFFERENCES AT 16N 18W FOR 1971
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

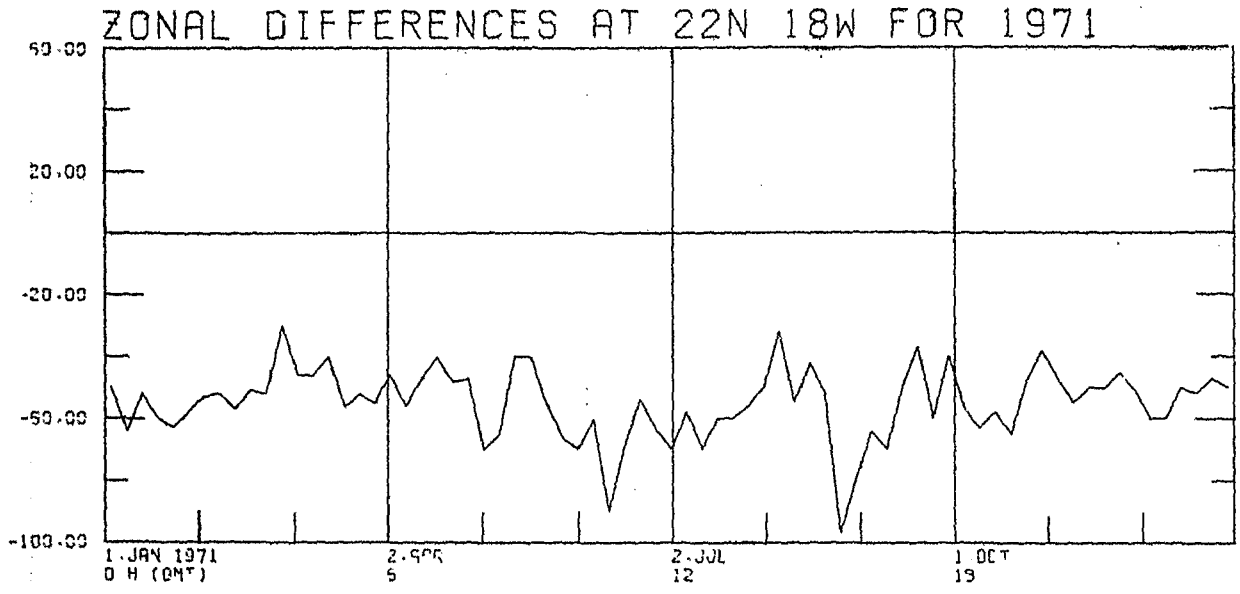

OSZ OF SST AT 16N 18W FOR 1971
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

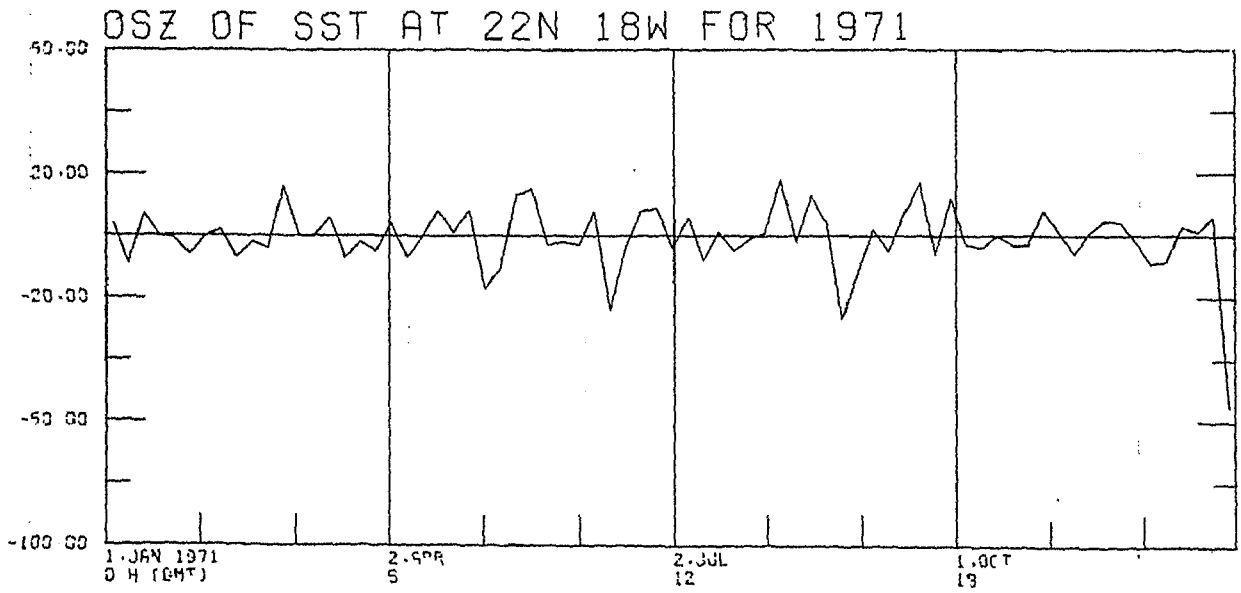

SEA-SURFACE-TEMP AT 20N 18W FOR 1971
320.00
280.00
240.00
200.00
150.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

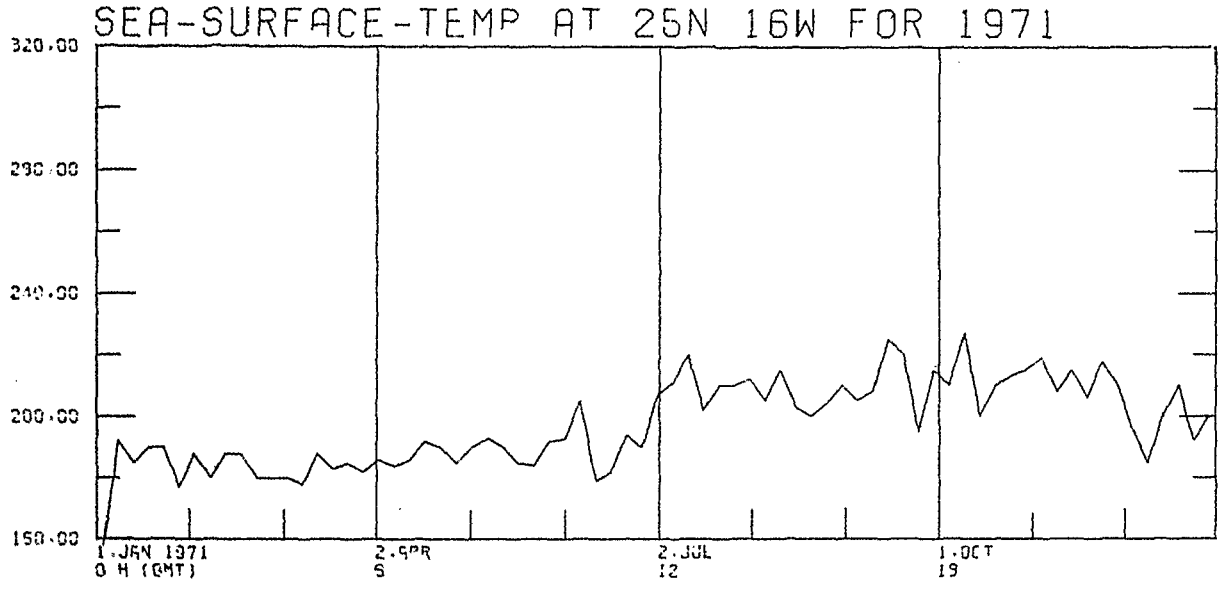

ZONAL DIFFERENCES AT 20N 18W FOR 1971
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

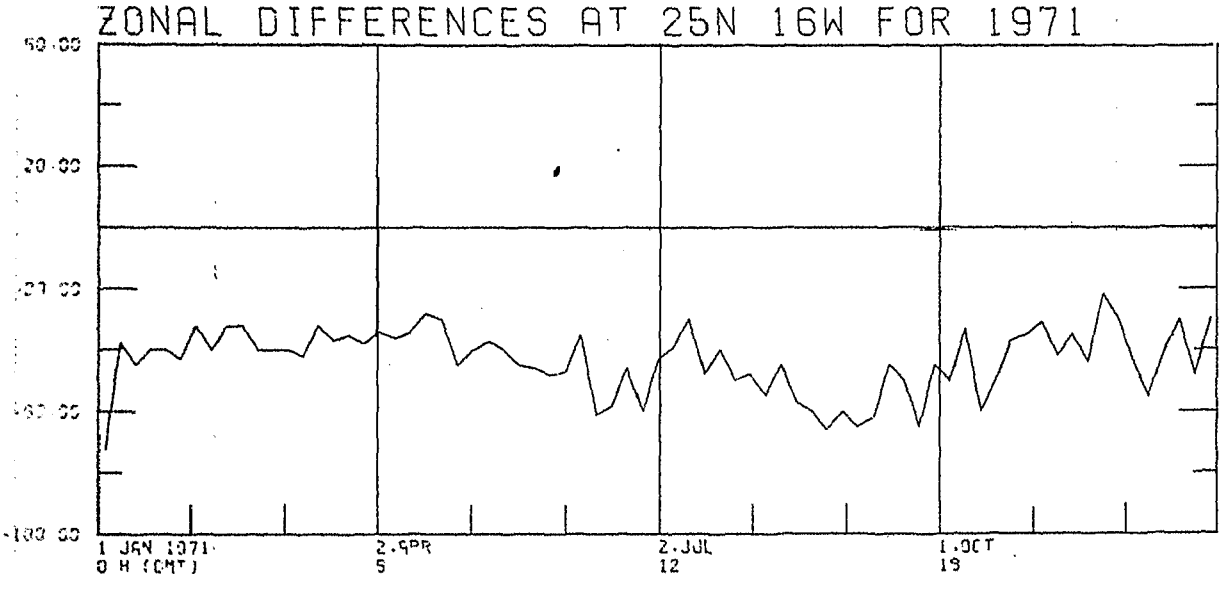

OSZ OF SST AT 20N 18W FOR 1971
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

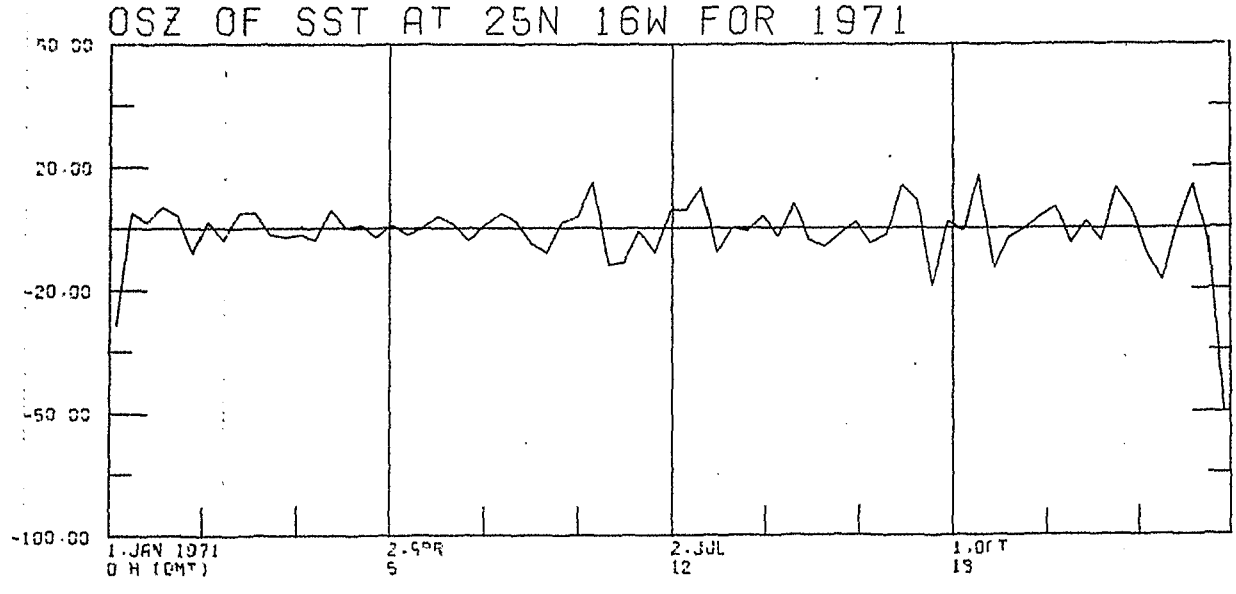

SEA-SURFACE-TEMP AT 22N 18W FOR 1971
320.00
280.00
240.00
200.00
160.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

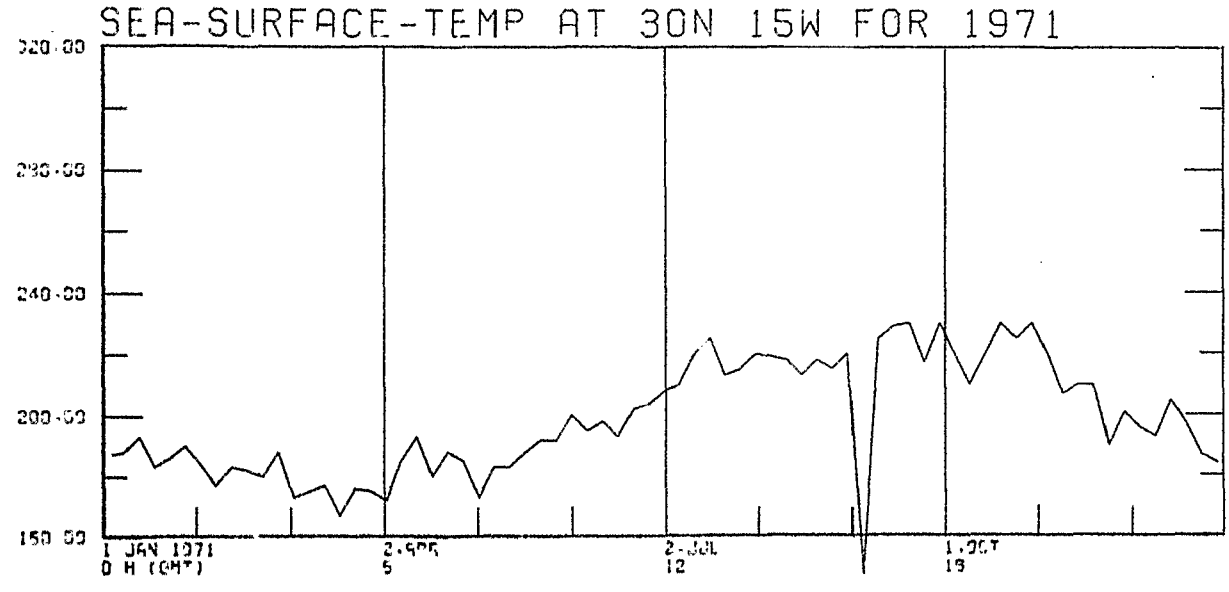

ZONAL DIFFERENCES AT 22N 18W FOR 1971
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

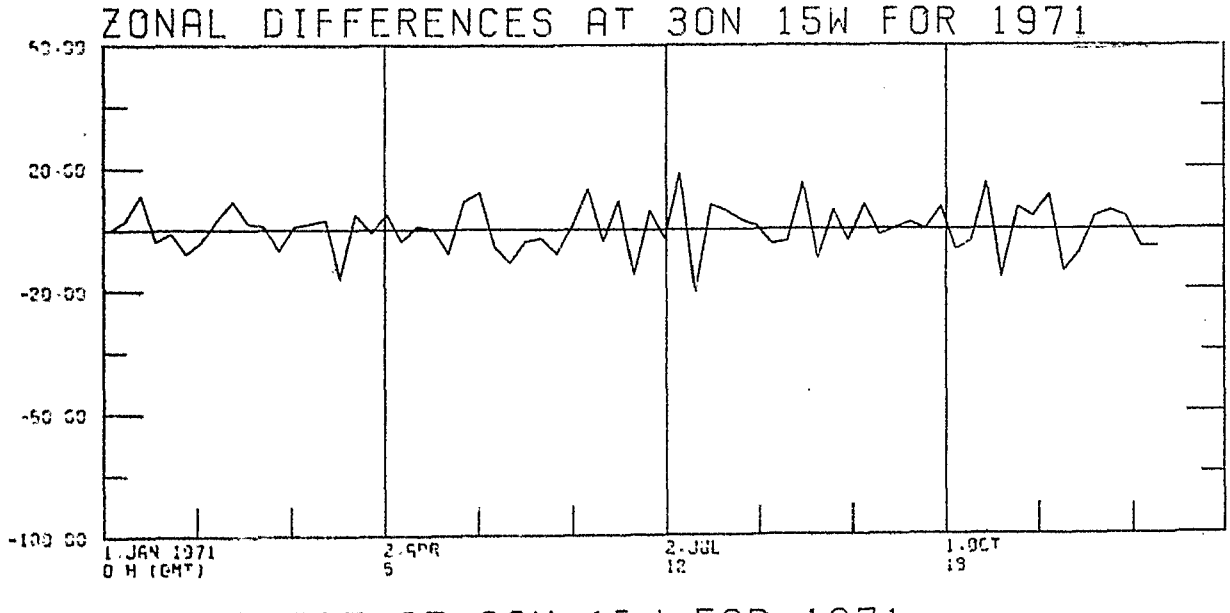

OSZ OF SST AT 22N 18W FOR 1971
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1971
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

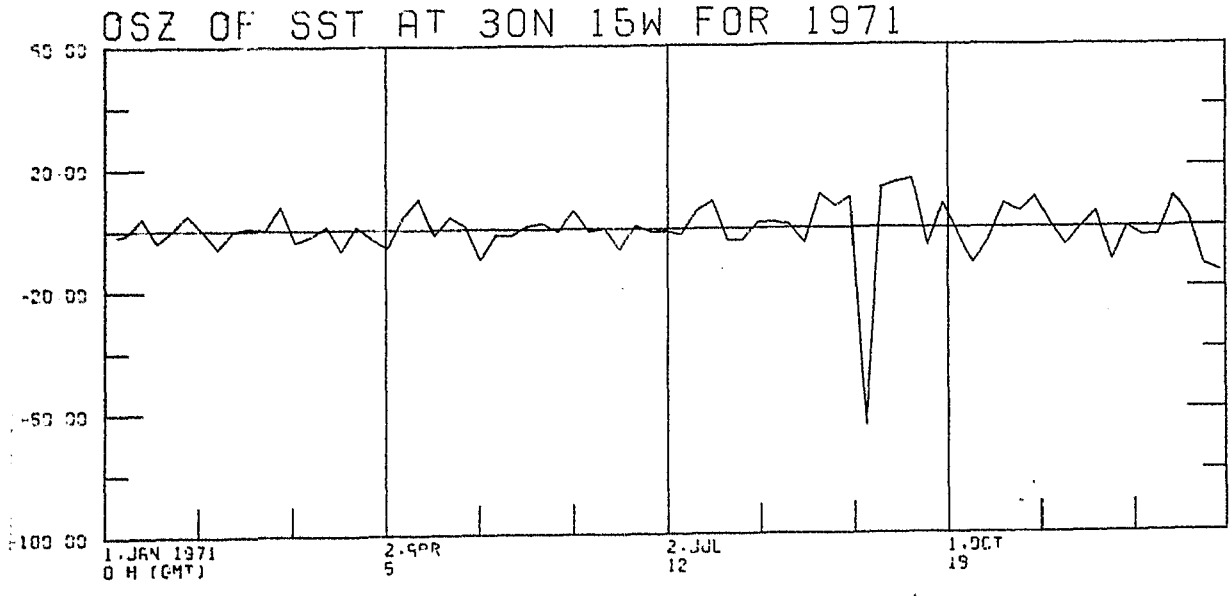

SEA-SURFACE-TEMP AT 25N 16W FOR 1971
320.00
280.00
240.00
200.00
160.00
1 JAN 1971
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

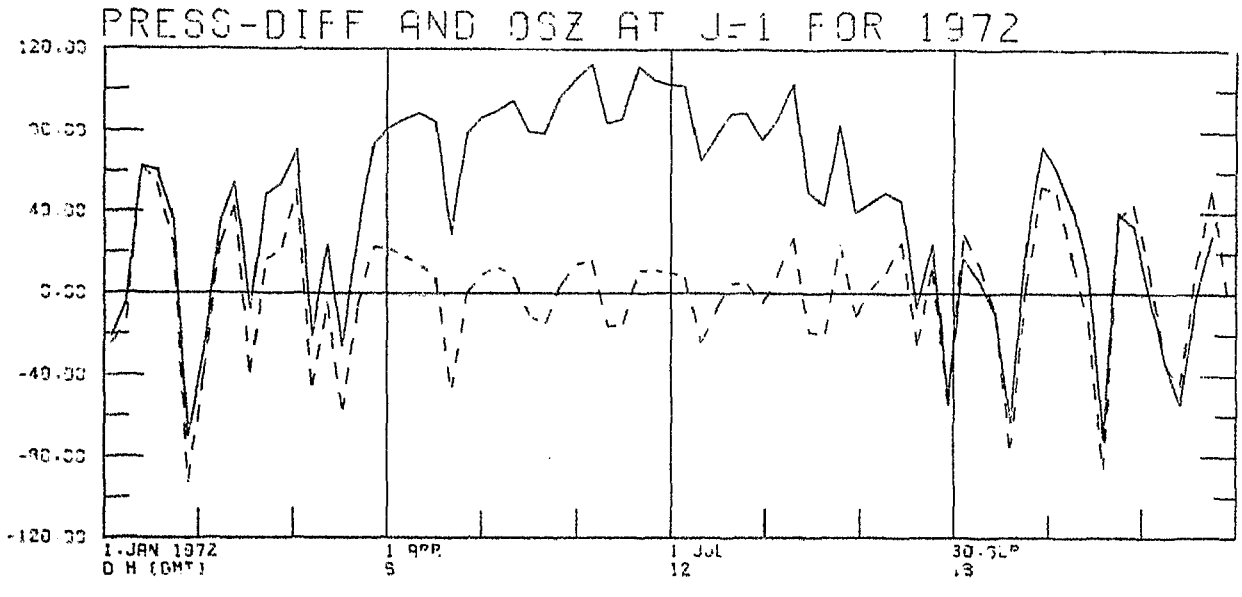

ZONAL DIFFERENCES AT 25N 16W FOR 1971
60.00
20.00
-100.00
1 JAN 1971
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

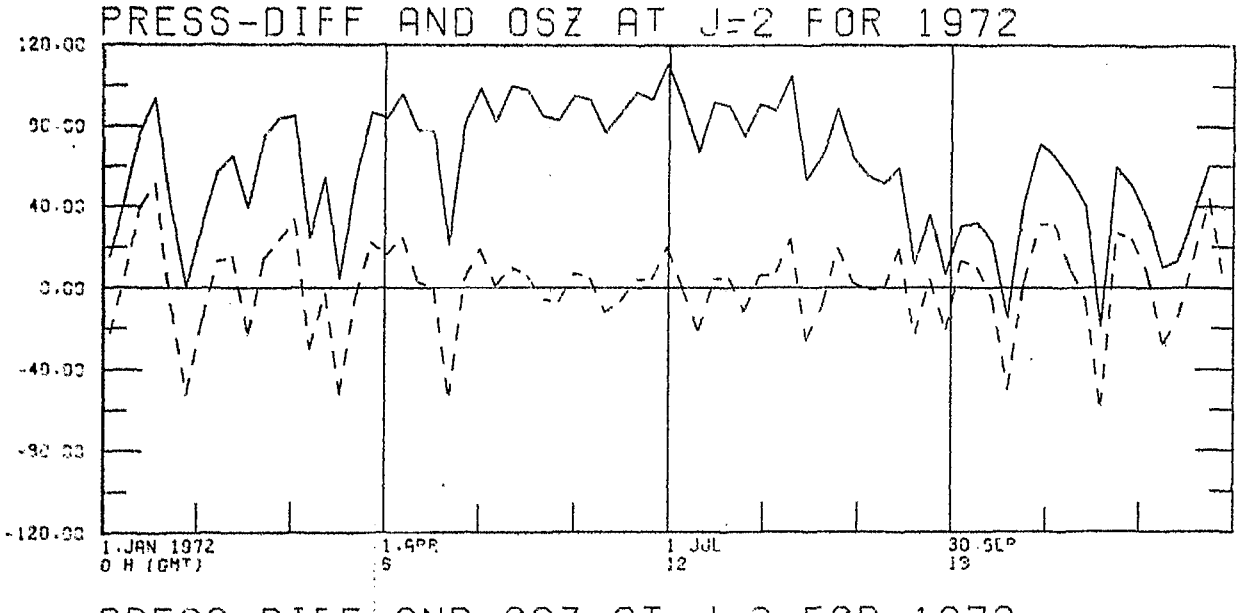

OSZ OF SST AT 25N 16W FOR 1971
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1971
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

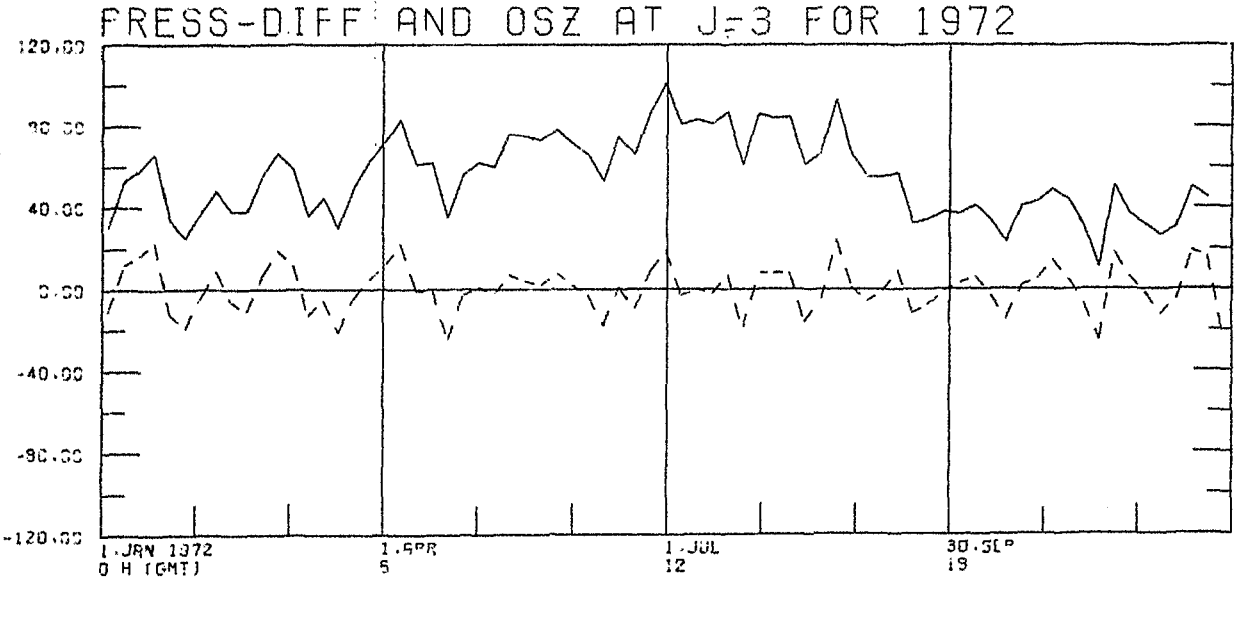

SEA-SURFACE-TEMP AT 30N 15W FOR 1971
320.00
280.00
240.00
200.00
150.00
1 JAN 1971
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

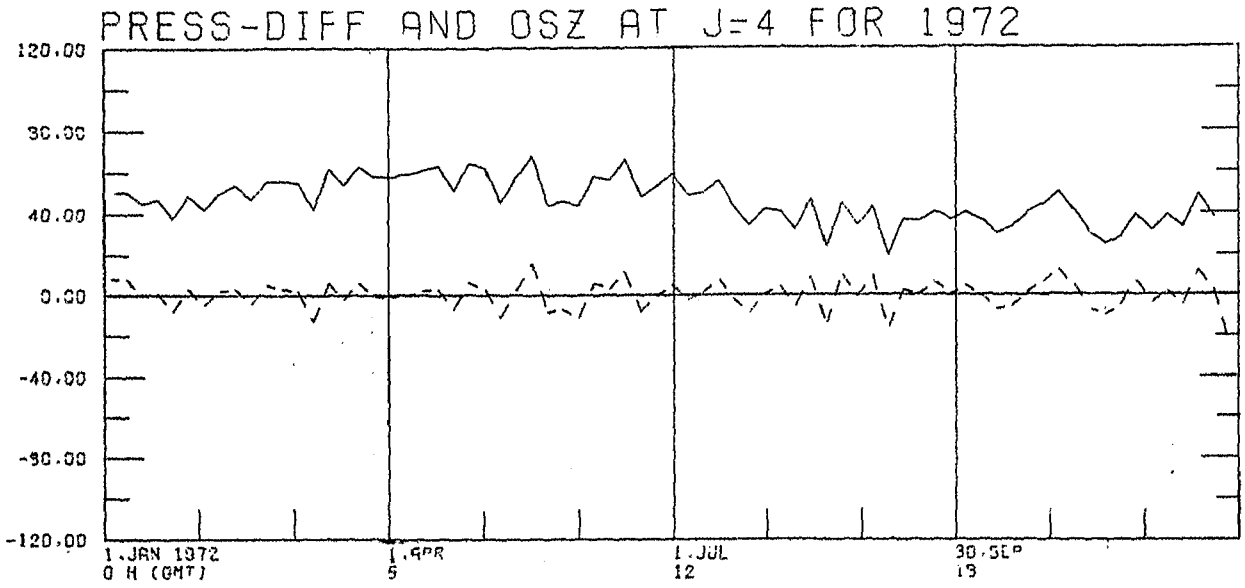

ZONAL DIFFERENCES AT 30N 15W FOR 1971
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1971
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

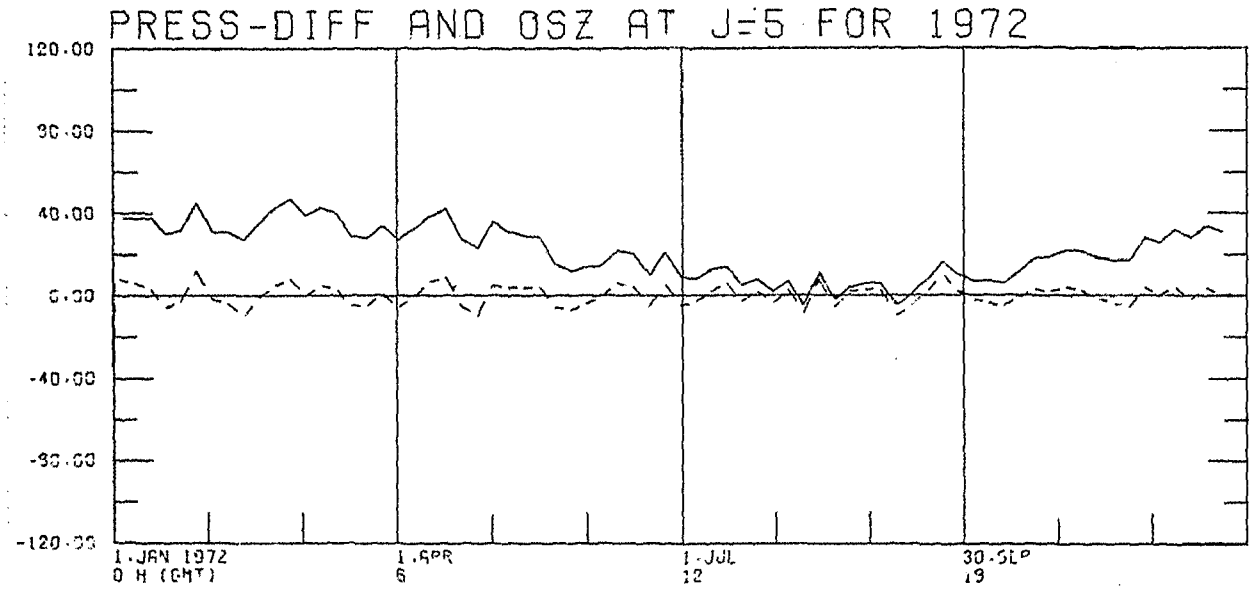

OSZ OF SST AT 30N 15W FOR 1971
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1971
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

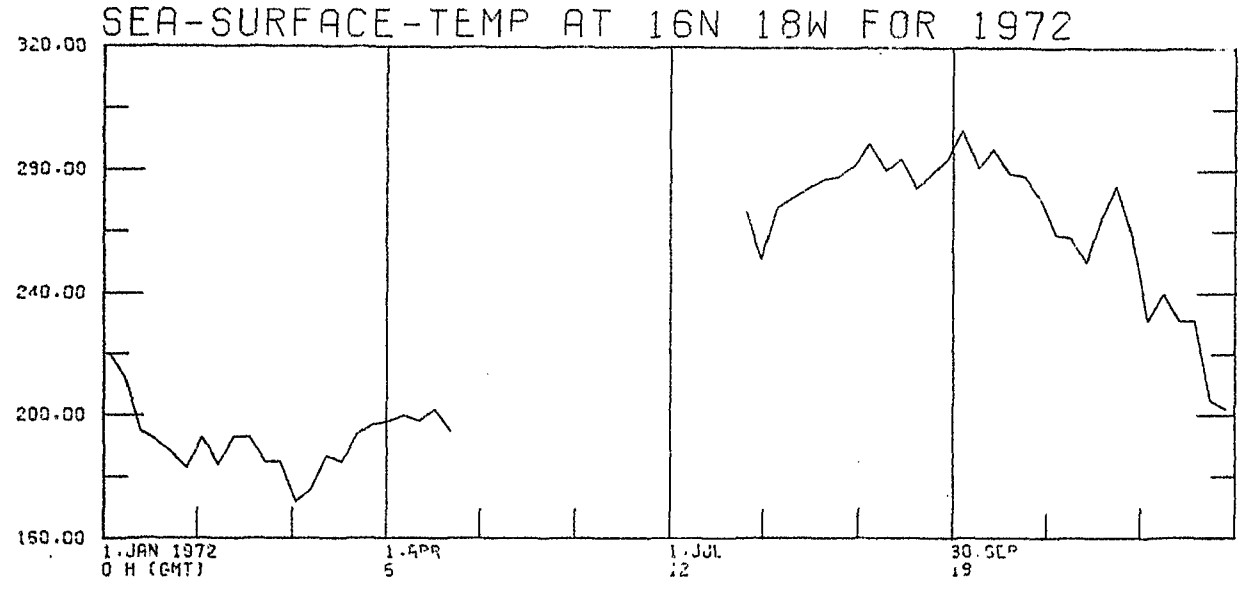

PRESS-DIFF AND OSZ AT J=1 FOR 1972
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1.JAN 1972
0 H (GMT)
1 APR
6
1 JUL
12
30.SEP
18

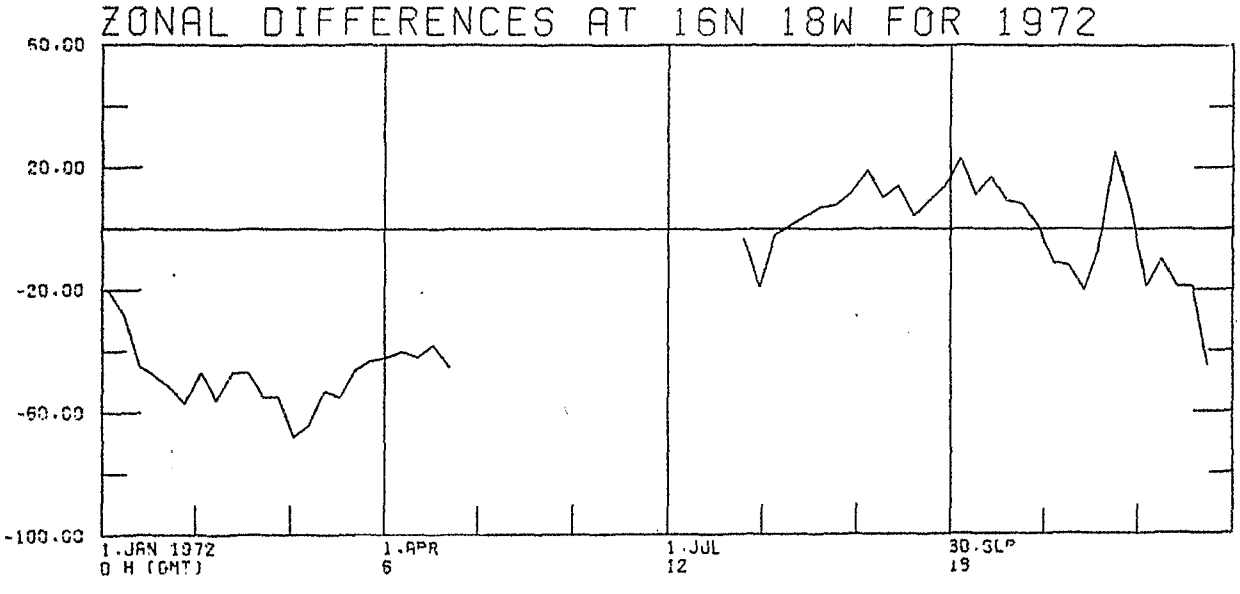

PRESS-DIFF AND OSZ AT J=2 FOR 1972
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1.JAN 1972
0 H (GMT)
1.APR
6
1 JUL
12
30.SEP
18

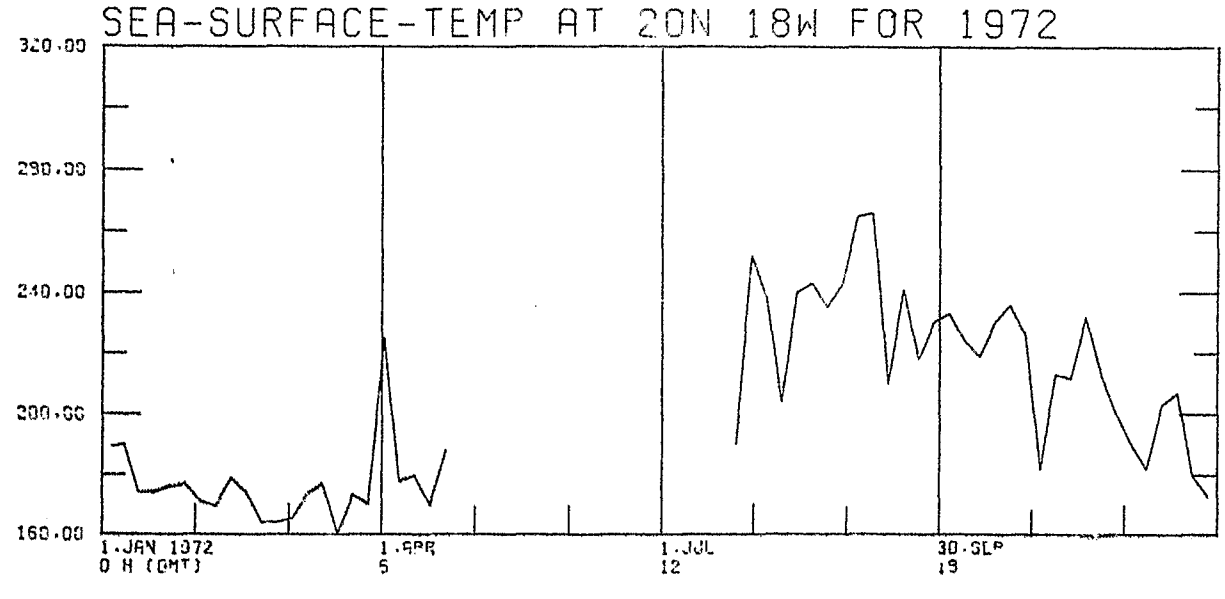

PRESS-DIFF AND OSZ AT J=3 FOR 1972
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1.JAN 1972
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
18

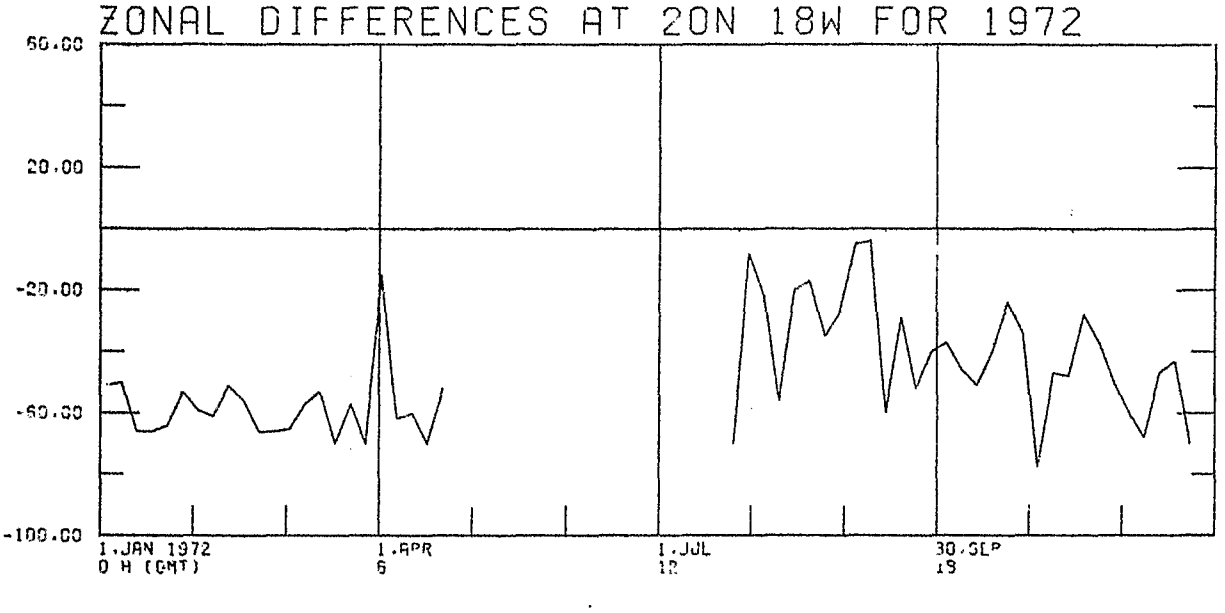

PRESS-DIFF AND OSZ AT J=4 FOR 1972
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1.JAN 1972
0 H (GMT)
1.APR
5
1.JUL
12
30.SEP
19

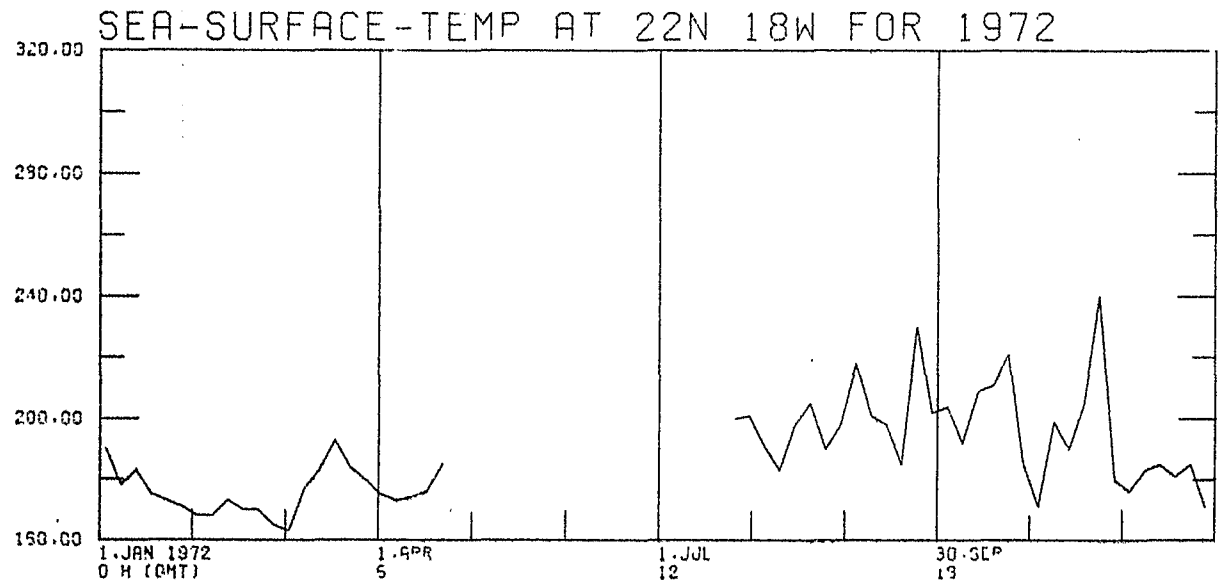

PRESS-DIFF AND OSZ AT J=5 FOR 1972
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1.JAN 1972
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
19

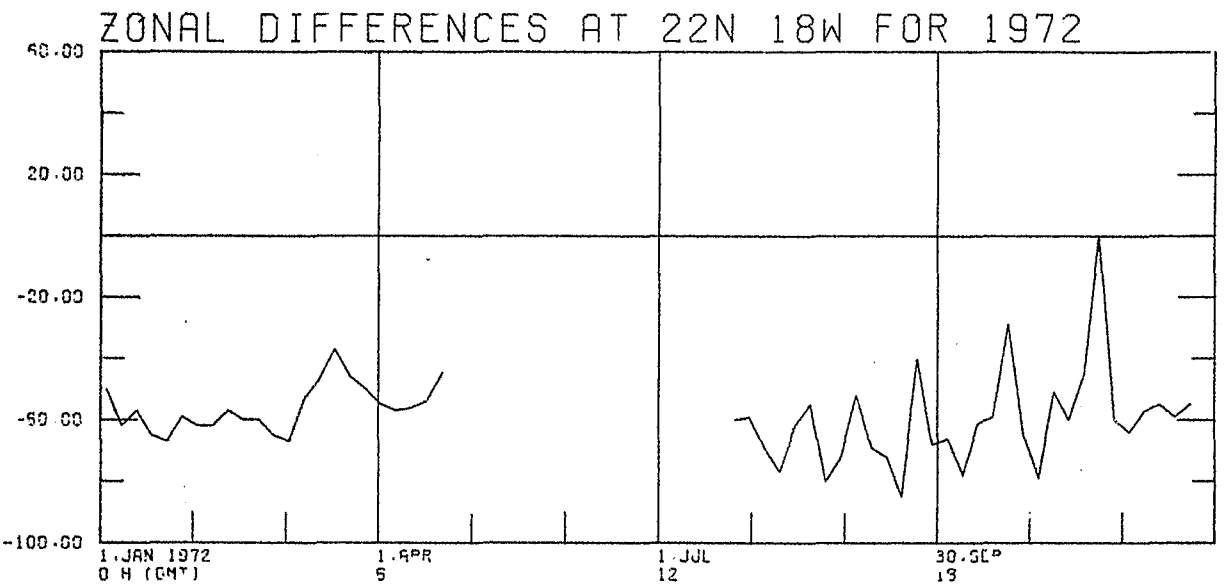

SEA-SURFACE-TEMP AT 16N 18W FOR 1972
320.00
290.00
240.00
200.00
160.00
1.JAN 1972
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
19

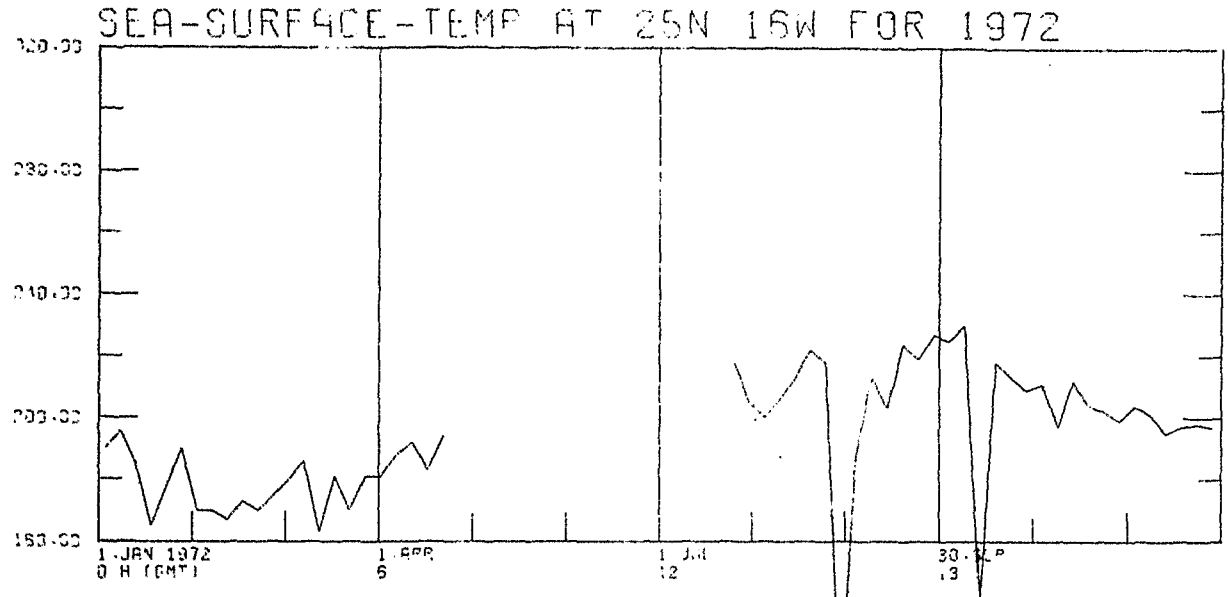

ZONAL DIFFERENCES AT 16N 18W FOR 1972
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1972
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
19

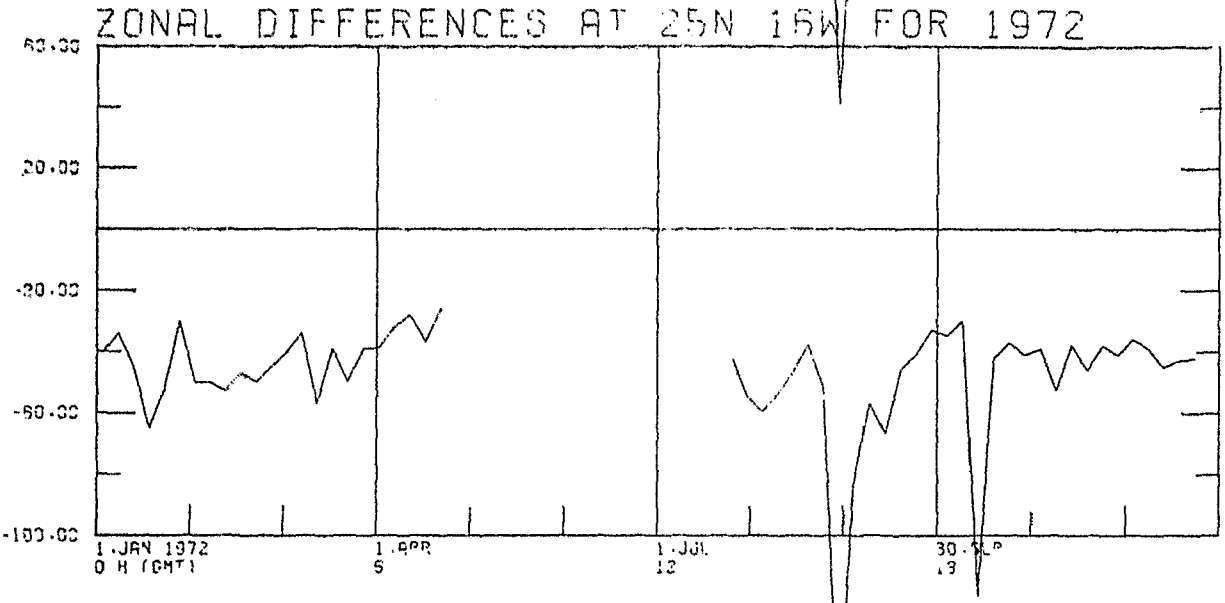

SEA-SURFACE-TEMP AT 20N 18W FOR 1972
320.00
280.00
240.00
200.00
160.00
1.JAN 1972
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
18

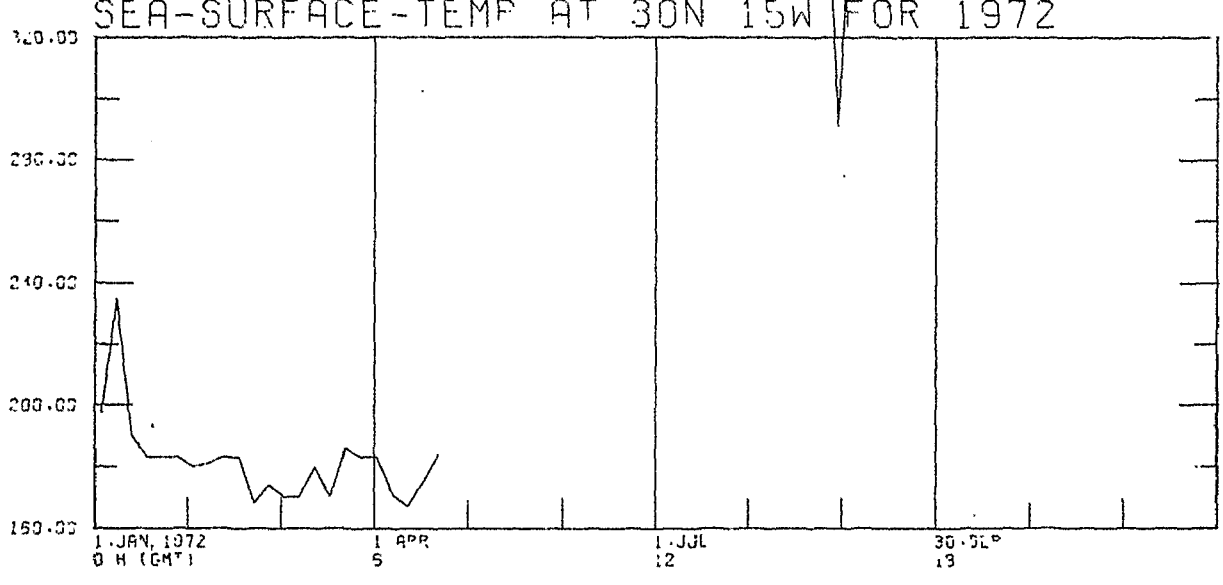

ZONAL DIFFERENCES AT 20N 18W FOR 1972
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1972
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
18

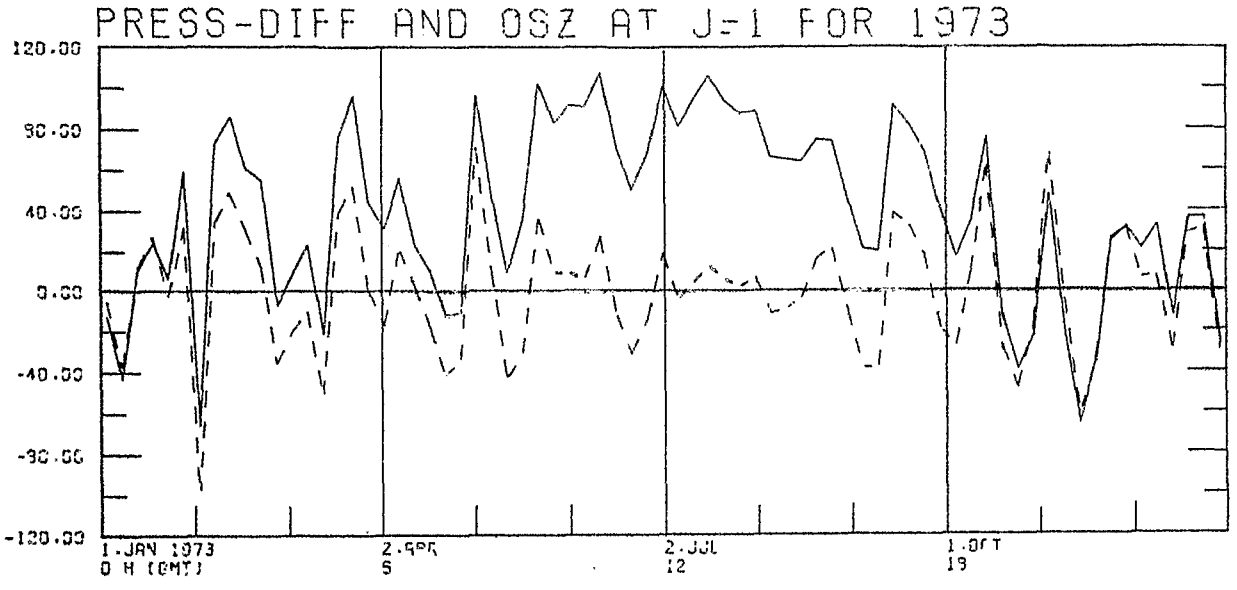

SEA-SURFACE-TEMP AT 22N 18W FOR 1972
320.00
280.00
240.00
200.00
160.00
1.JAN 1972
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
18

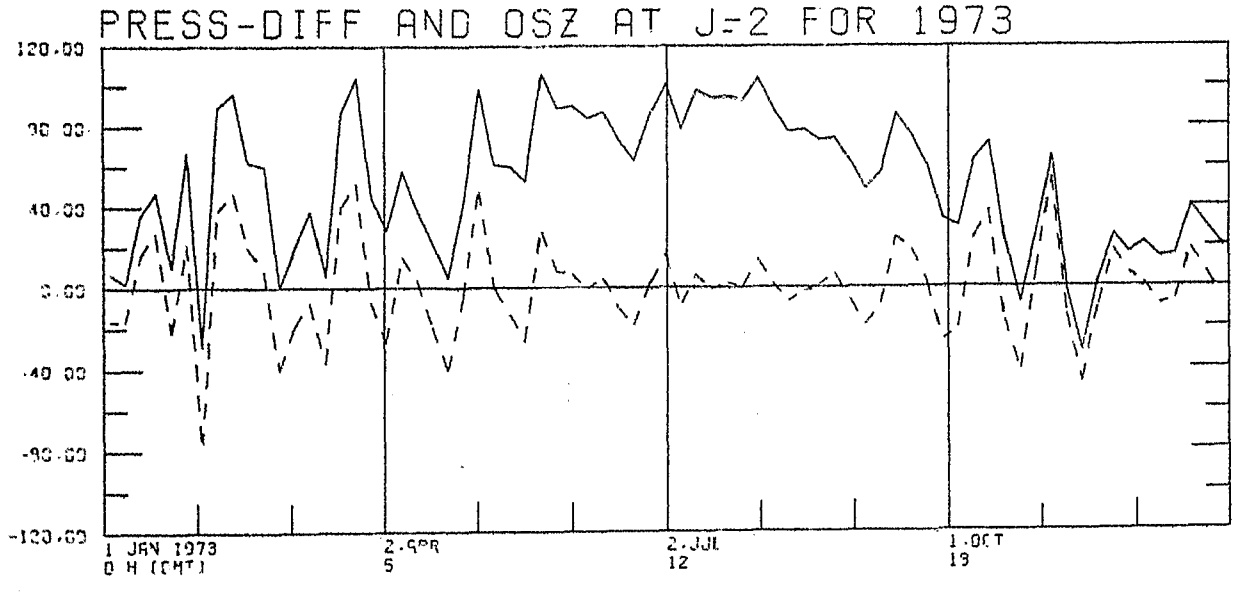

ZONAL DIFFERENCES AT 22N 18W FOR 1972
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1972
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
18

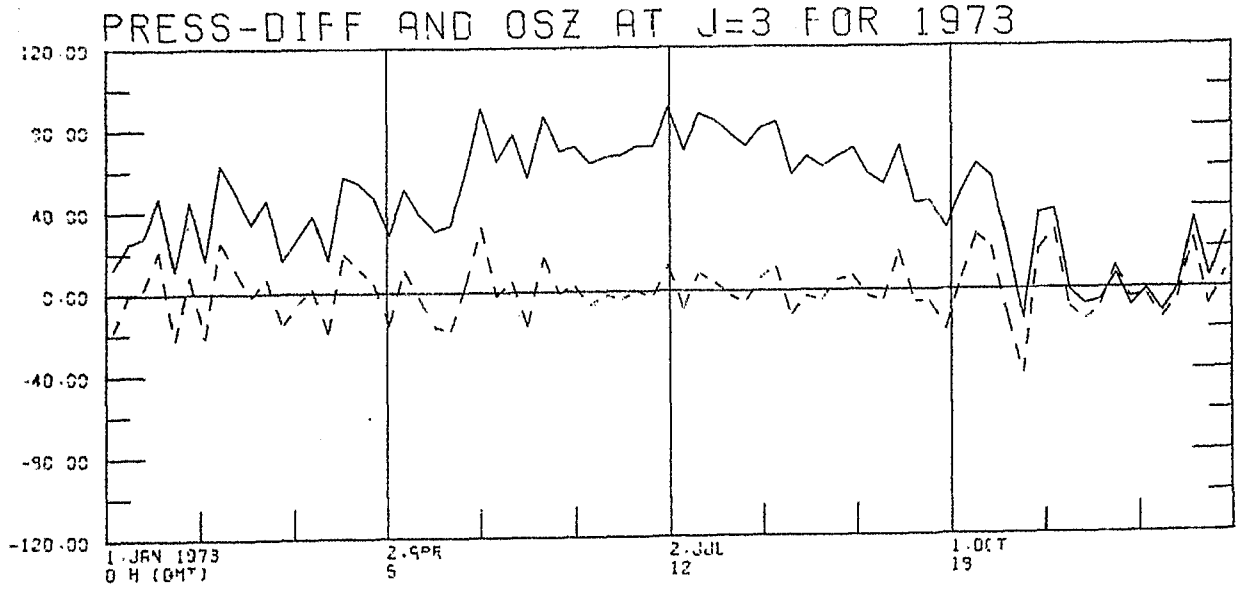

SEA-SURFACE-TEMP AT 25N 15W FOR 1972
1 JAN 1972
0 H (GMT)
1 APR
5
1 JUL
12
30 SEP
13

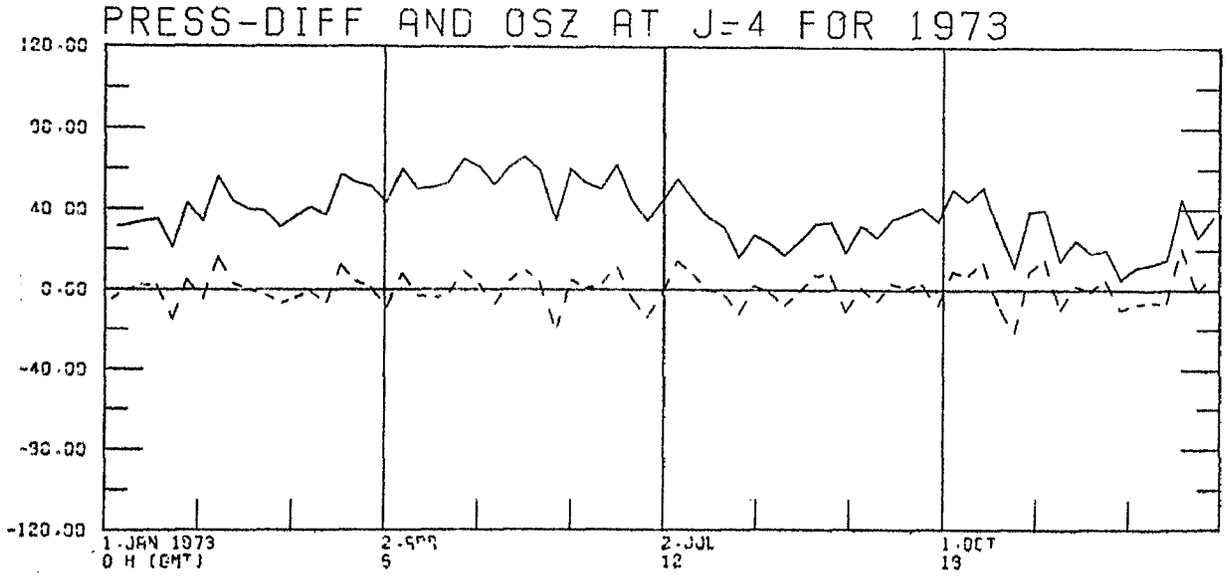

ZONAL DIFFERENCES AT 25N 15W FOR 1972
1 JAN 1972
0 H (GMT)
1 APR
5
1 JUL
12
30 SEP
13

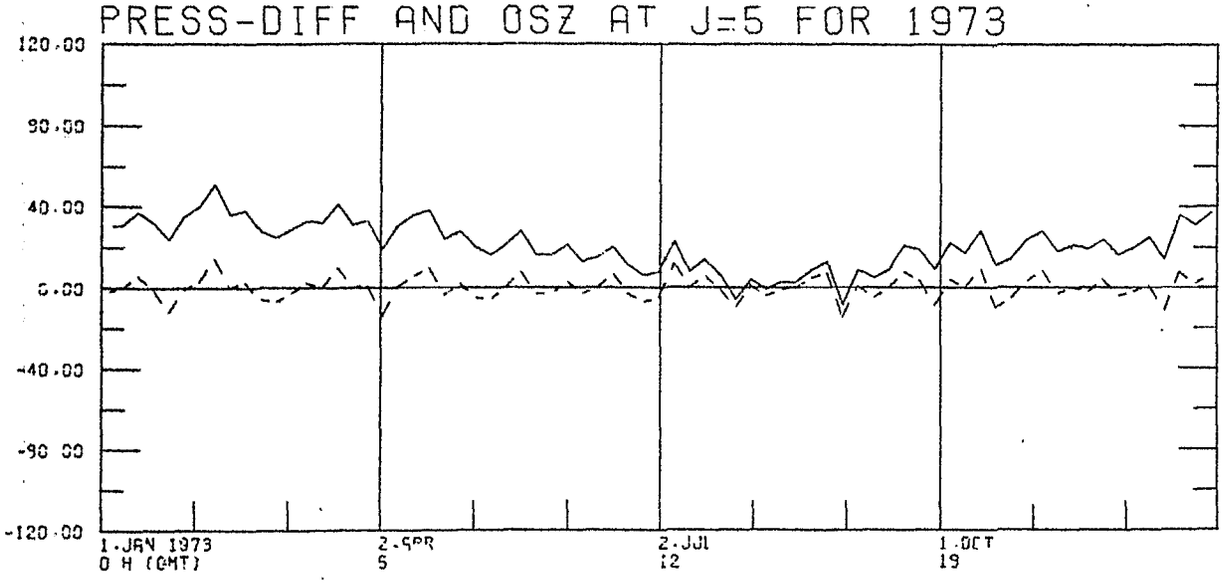

SEA-SURFACE-TEMP AT 30N 15W FOR 1972
1 JAN 1972
0 H (GMT)
1 APR
5
1 JUL
12
30 SEP
13

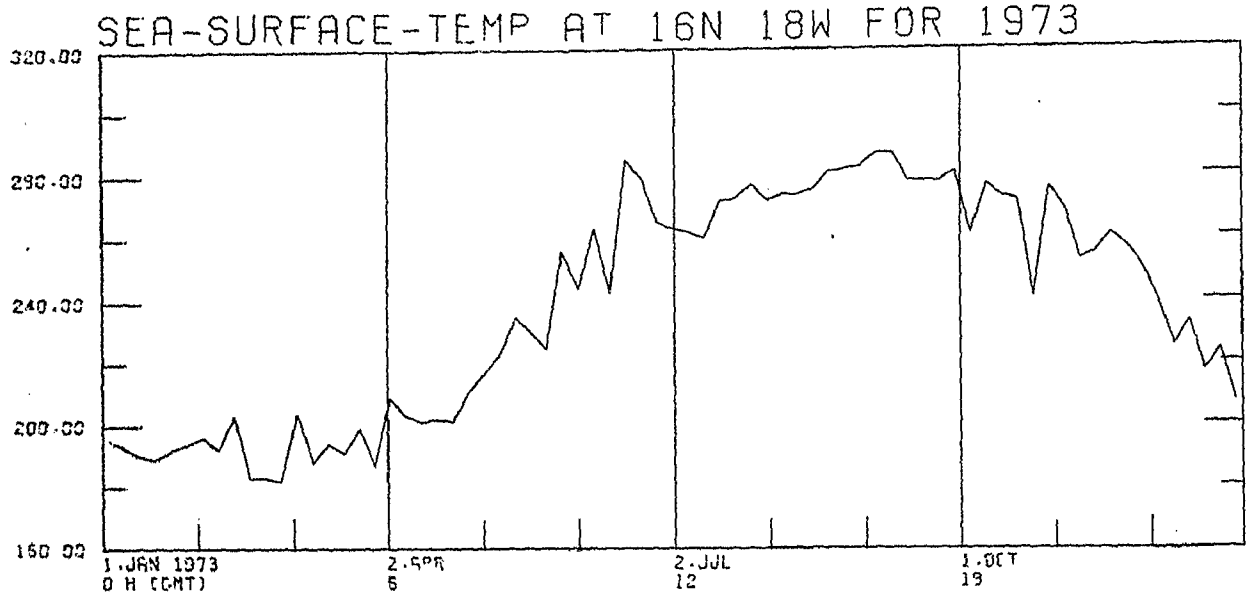

PRESS-DIFF AND OSZ AT J=1 FOR 1973
120.00
90.00
40.00
0.00
-40.00
-90.00
-120.00
1.JAN 1973
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

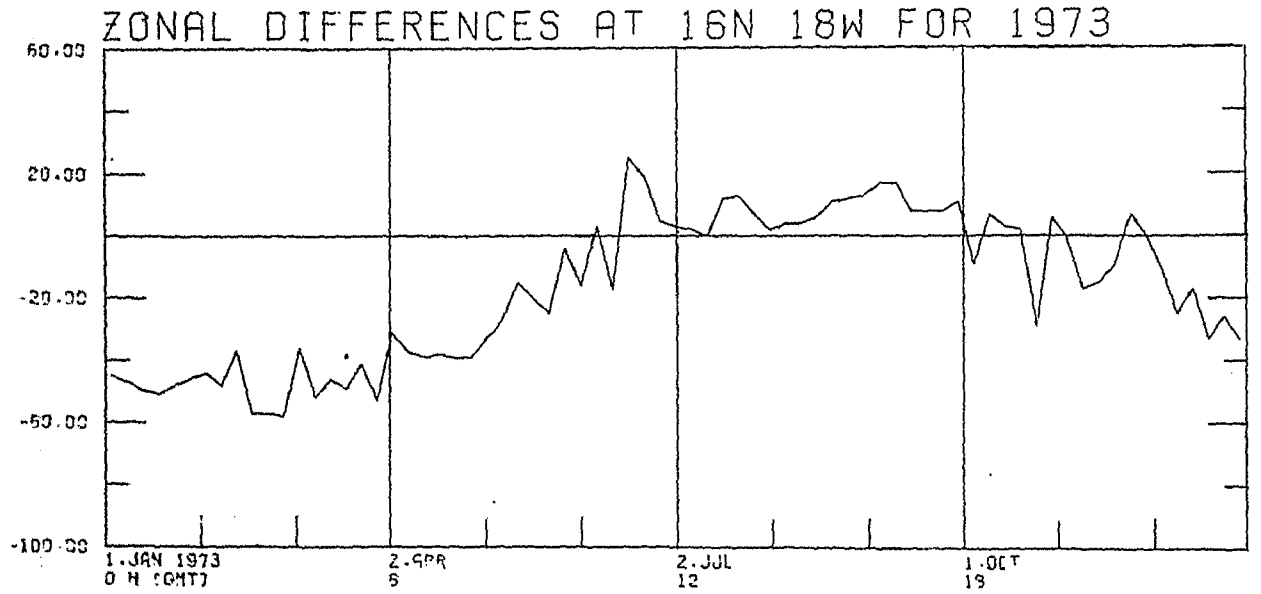

PRESS-DIFF AND OSZ AT J=2 FOR 1973
120.00
90.00
40.00
0.00
-40.00
-90.00
-120.00
1 JAN 1973
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

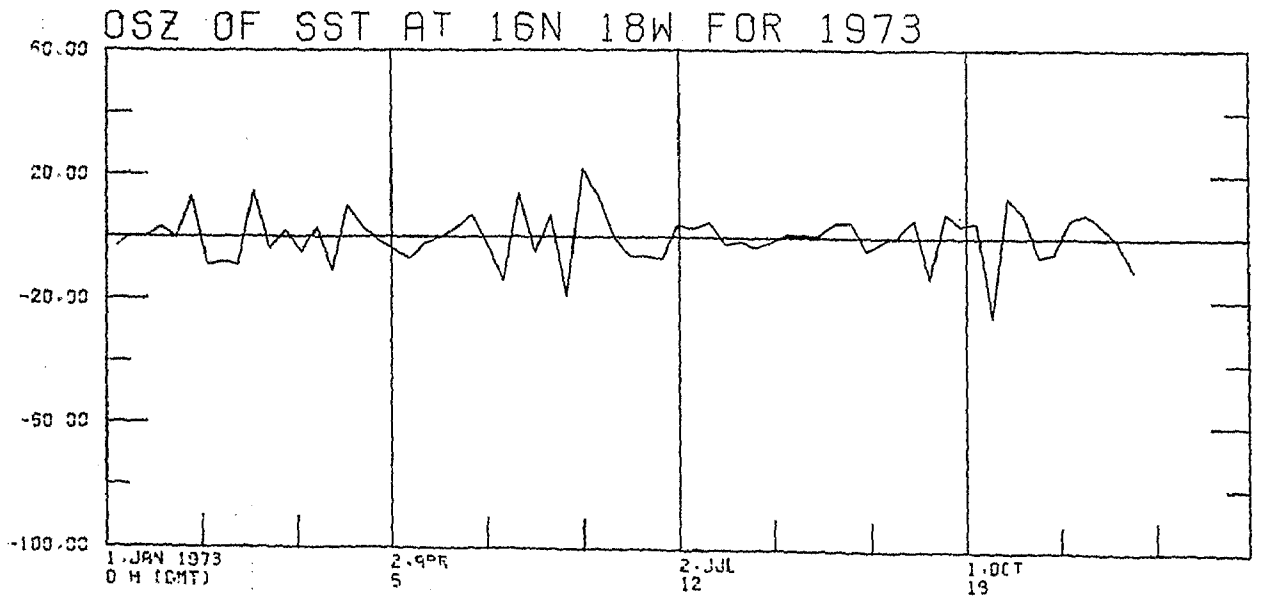

PRESS-DIFF AND OSZ AT J=3 FOR 1973
120.00
90.00
40.00
0.00
-40.00
-90.00
-120.00
1.JAN 1973
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

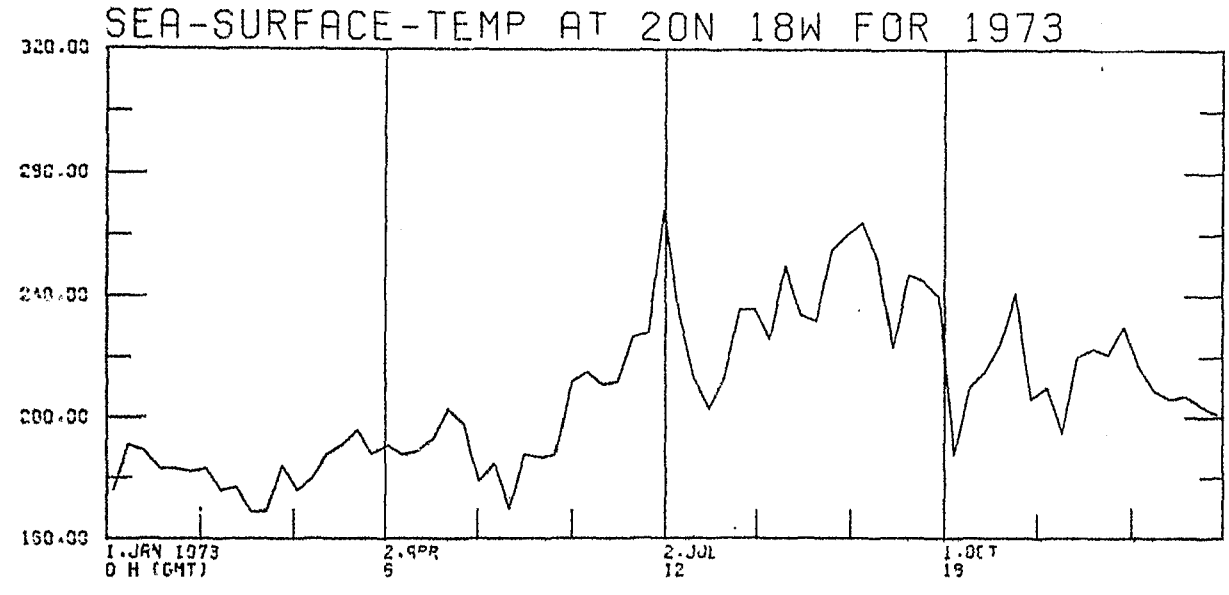

PRESS-DIFF AND OSZ AT J=4 FOR 1973
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1-JAN 1973
0 H (GMT)
2-APR
6
2-JUL
12
1-OCT
18

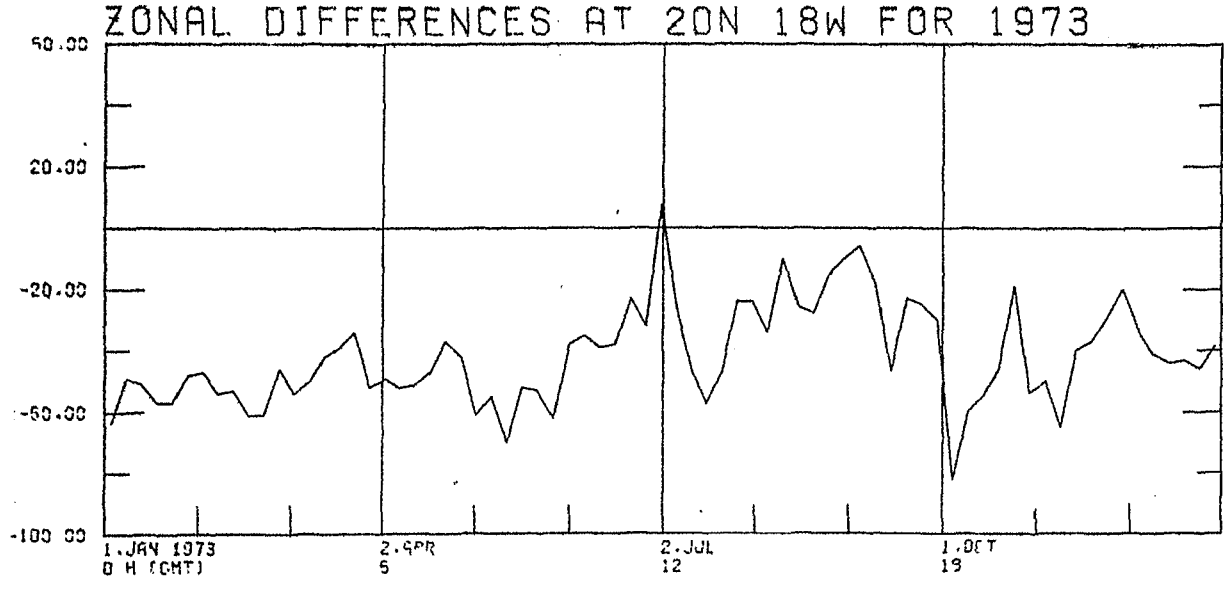

PRESS-DIFF AND OSZ AT J=5 FOR 1973
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1-JAN 1973
0 H (GMT)
2-APR
6
2-JUL
12
1-OCT
18

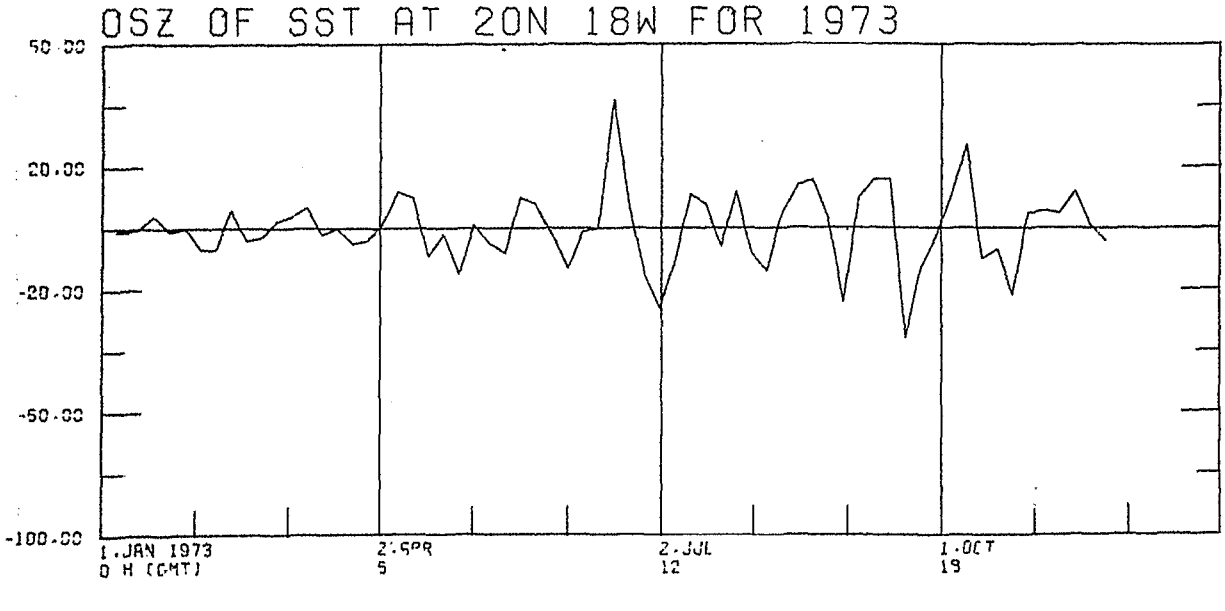

SEA-SURFACE-TEMP AT 16N 18W FOR 1973
320.00
280.00
240.00
200.00
160.00
1.JAN 1973
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

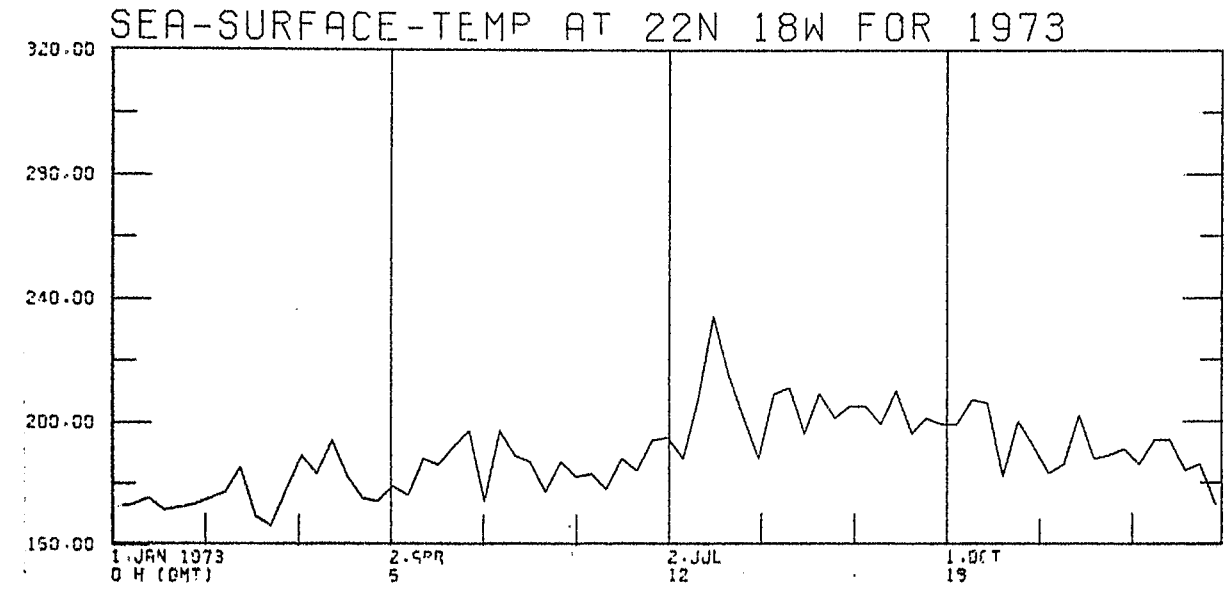

ZONAL DIFFERENCES AT 16N 18W FOR 1973
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1973
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

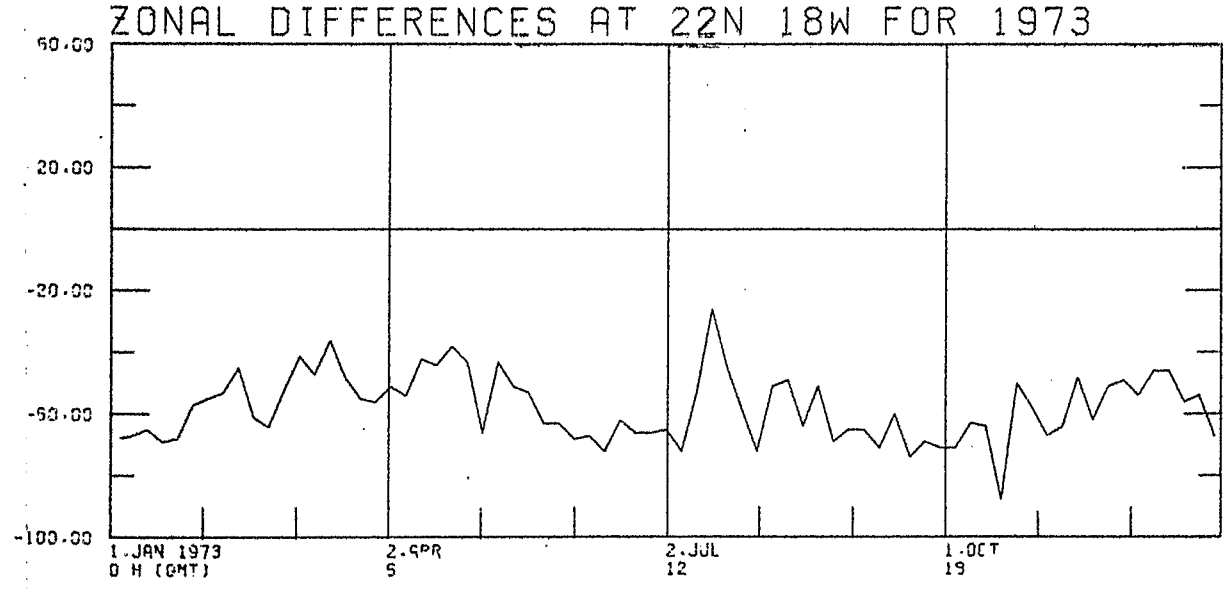

OSZ OF SST AT 16N 18W FOR 1973
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1973
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

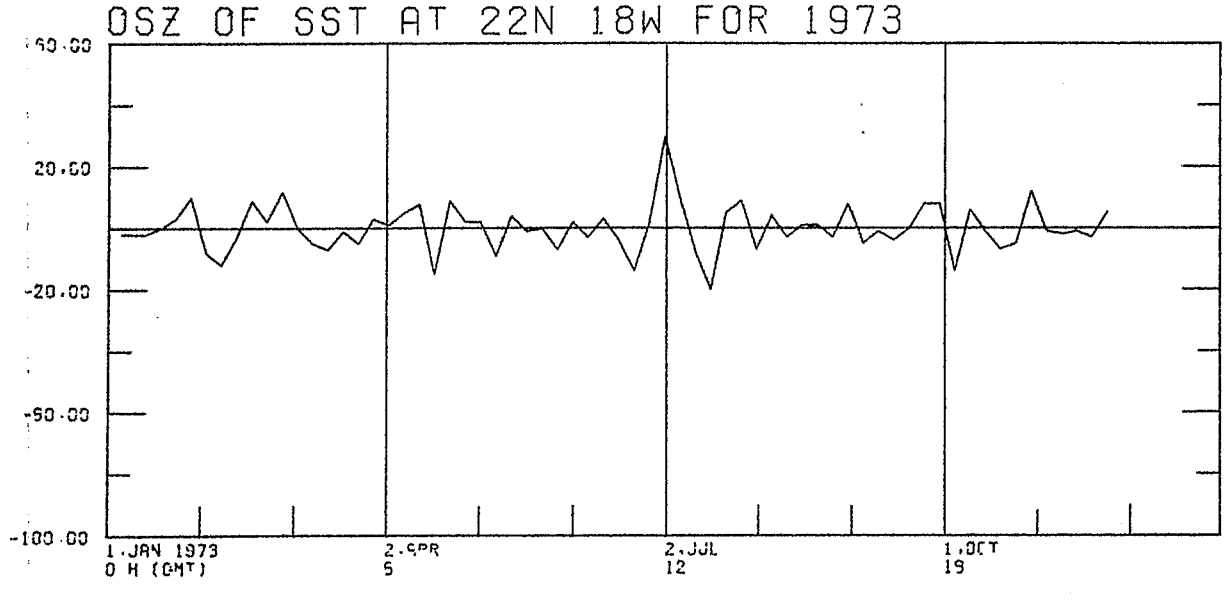

SEA-SURFACE-TEMP AT 20N 18W FOR 1973
320.00
280.00
240.00
200.00
160.00
1.JAN 1973
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

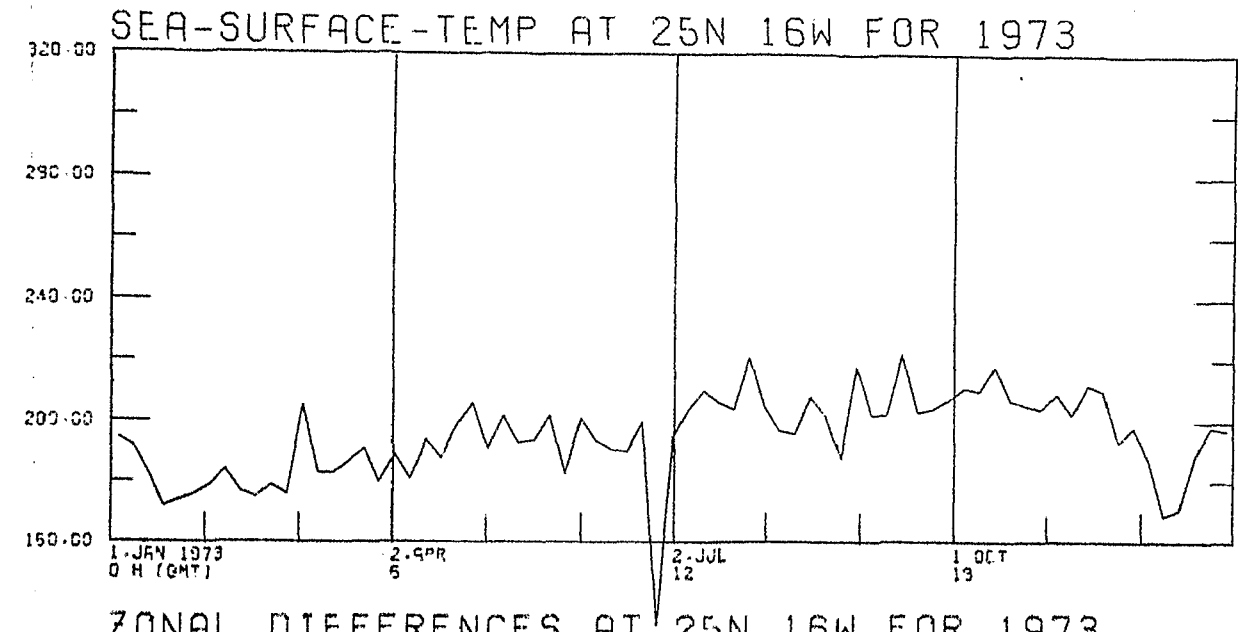

ZONAL DIFFERENCES AT 20N 18W FOR 1973
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1973
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

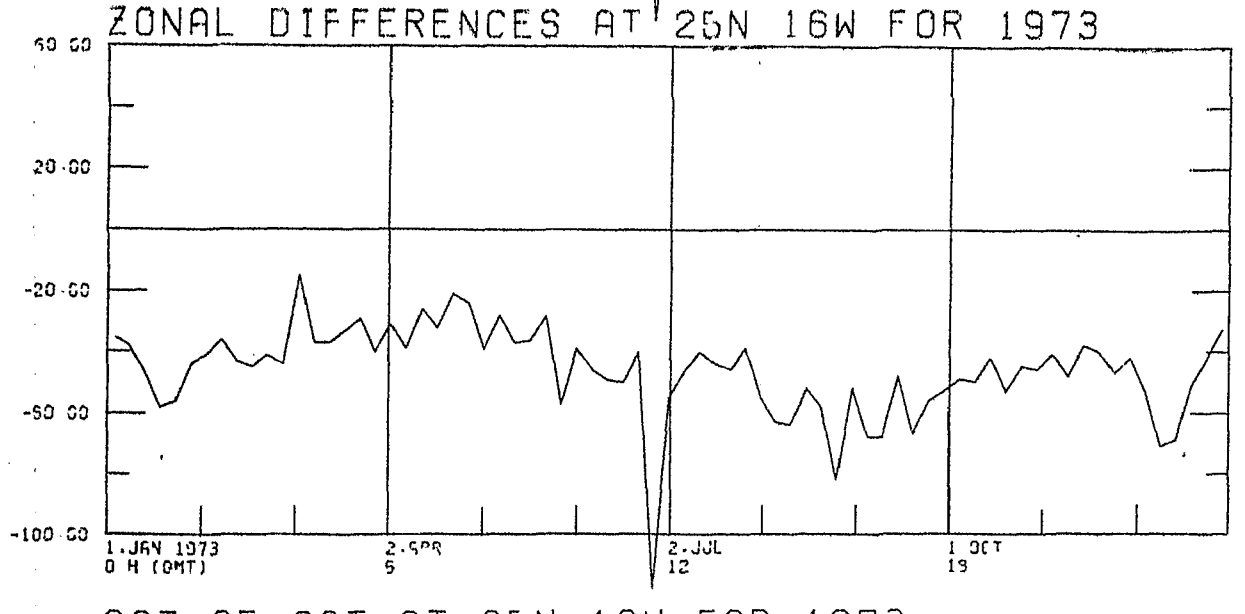

OSZ OF SST AT 20N 18W FOR 1973
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1973
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
18

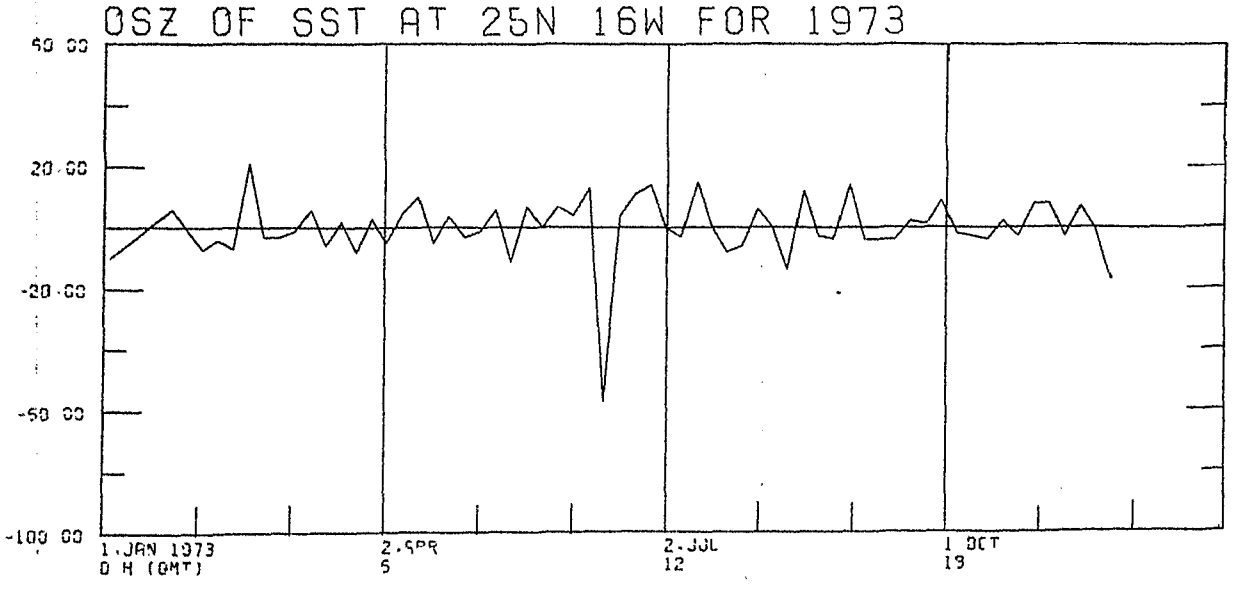

SEA-SURFACE-TEMP AT 22N 18W FOR 1973
320.00
280.00
240.00
200.00
160.00
1.JAN 1973
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

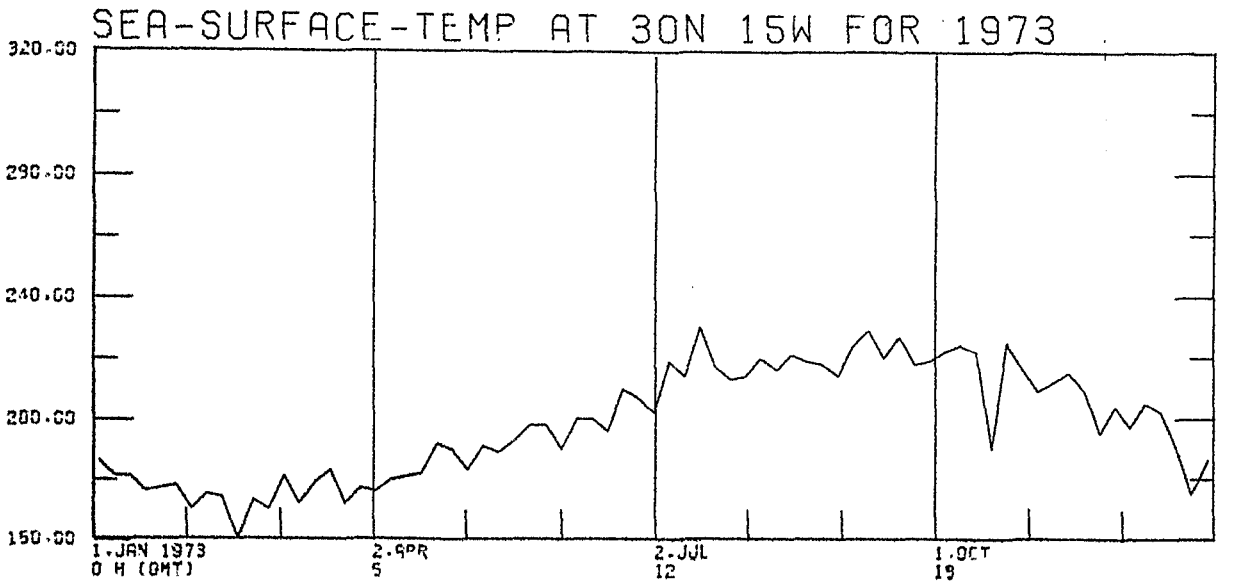

ZONAL DIFFERENCES AT 22N 18W FOR 1973
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1973
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

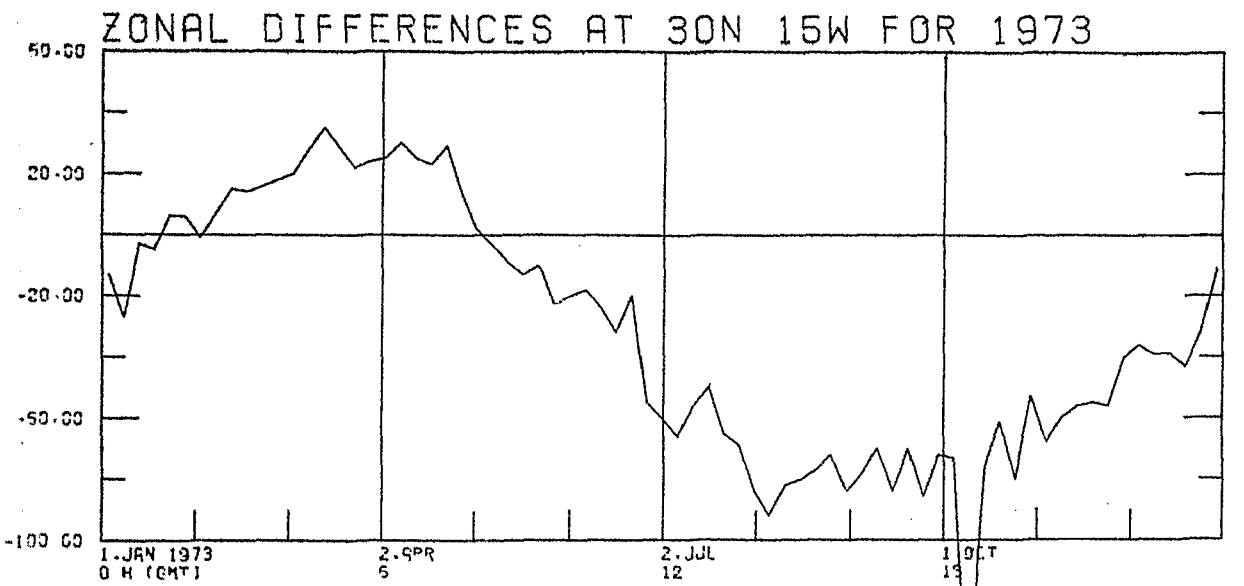

OSZ OF SST AT 22N 18W FOR 1973
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1973
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

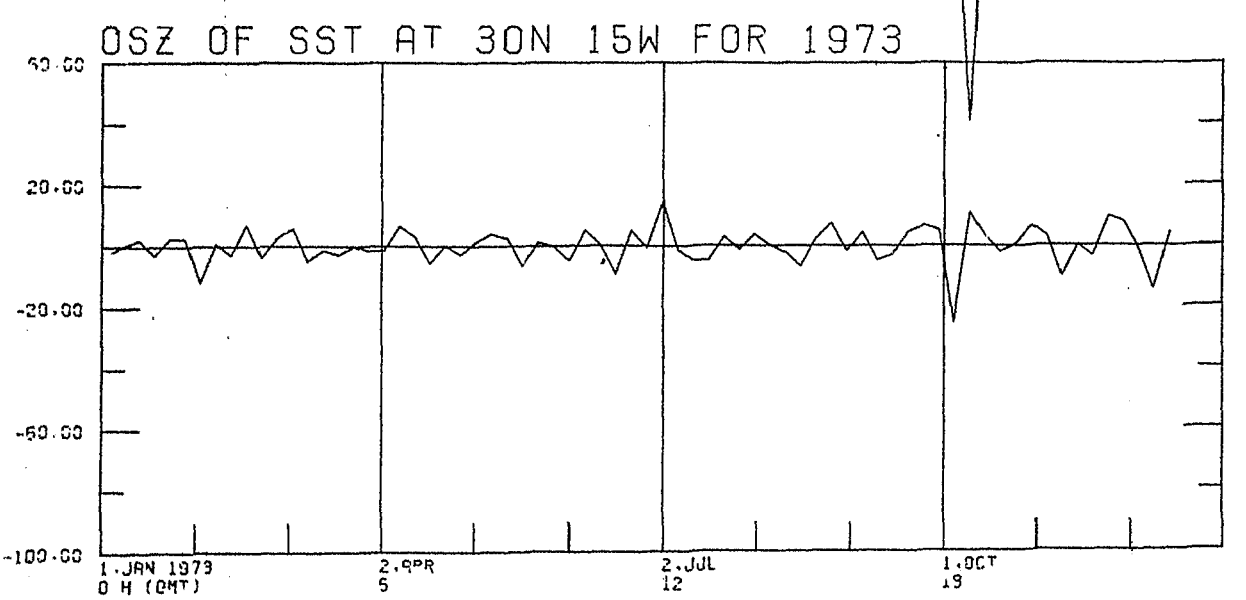

SEA-SURFACE-TEMP AT 25N 16W FOR 1973
320.00
290.00
240.00
200.00
150.00
1 JAN 1973
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
19

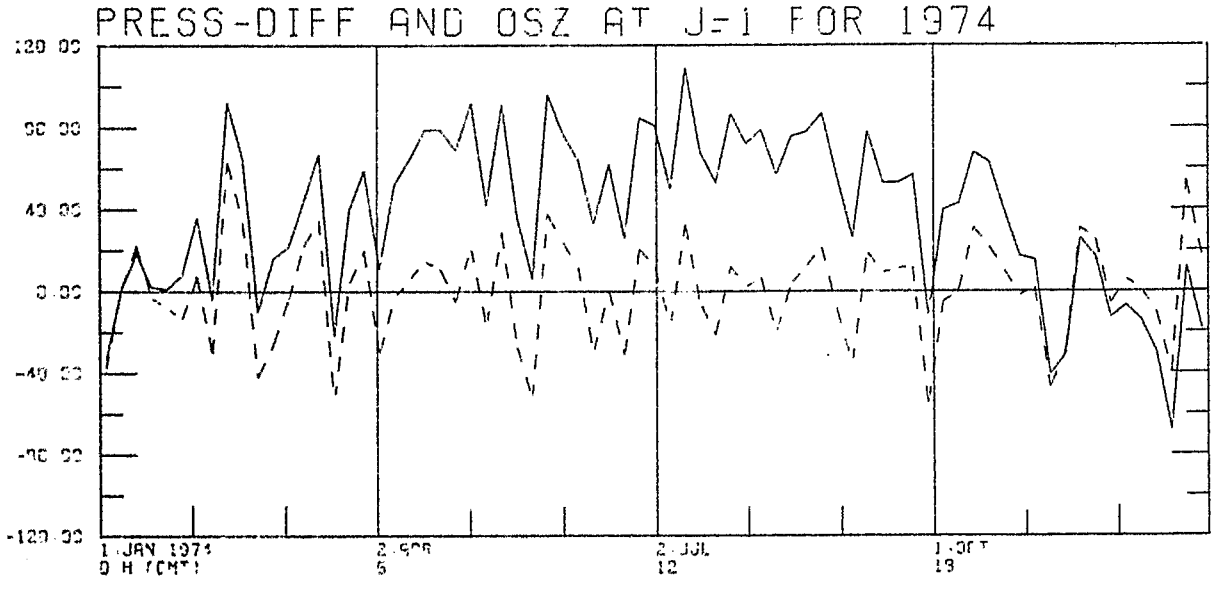

ZONAL DIFFERENCES AT 25N 16W FOR 1973
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1973
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
19

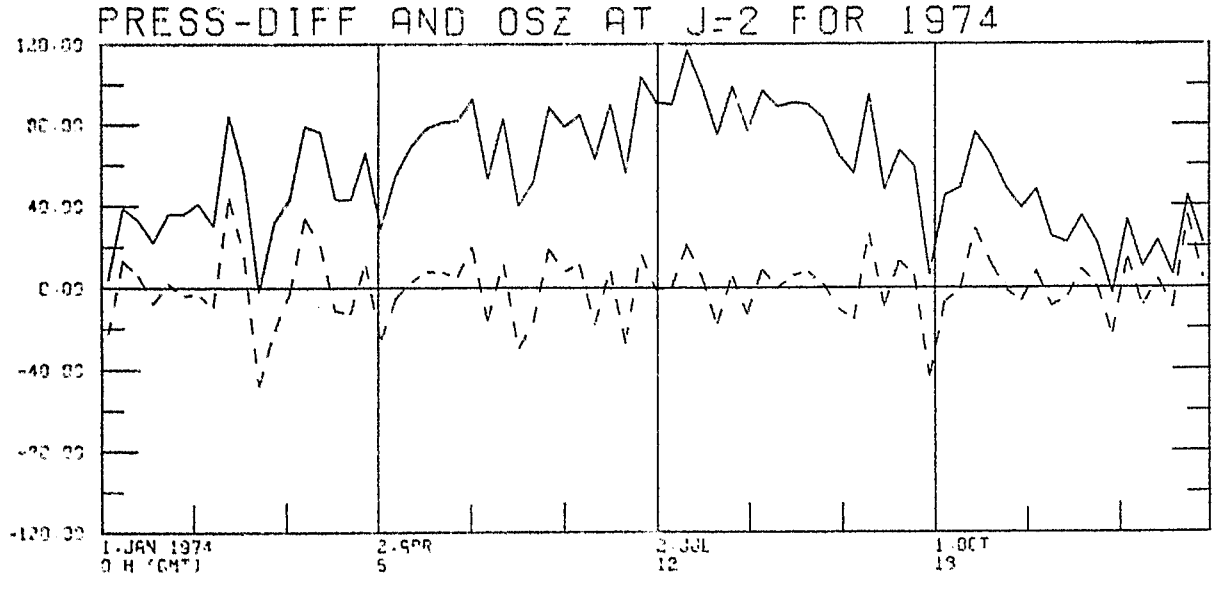

OSZ OF SST AT 25N 16W FOR 1973
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1973
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
19

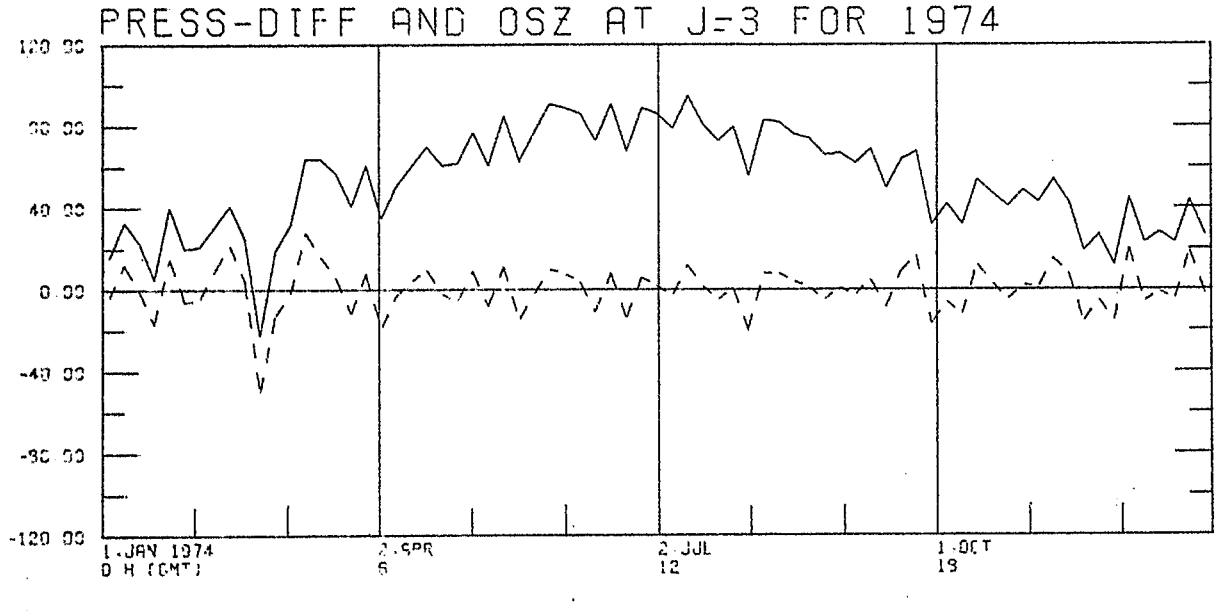

SEA-SURFACE-TEMP AT 30N 15W FOR 1973
320.00
280.00
240.00
200.00
150.00
1.JAN 1973
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

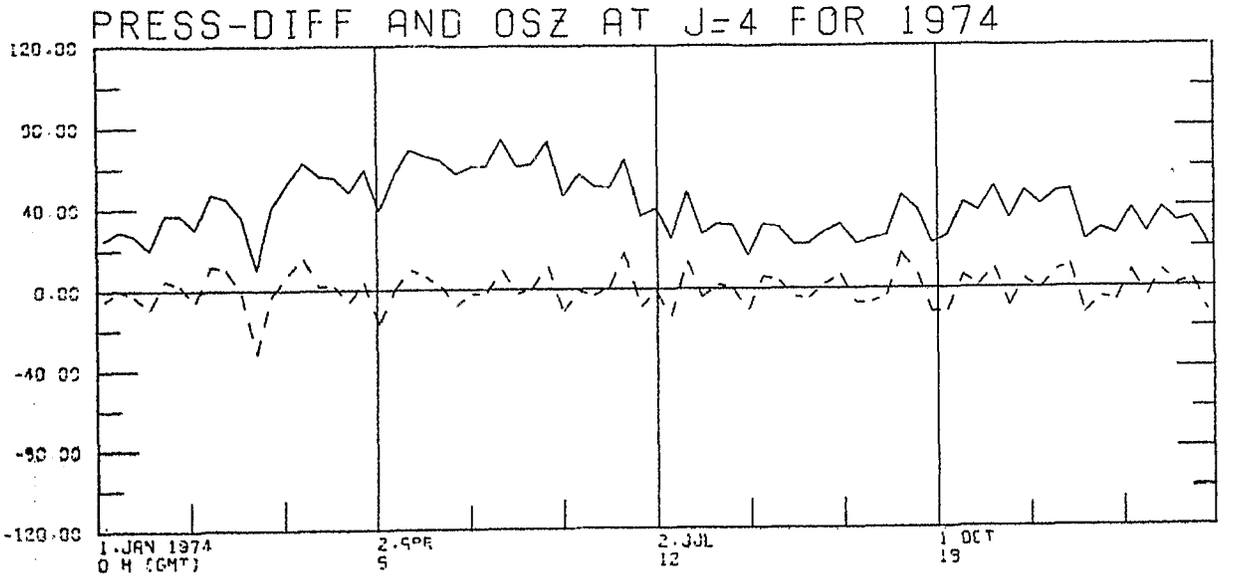

ZONAL DIFFERENCES AT 30N 15W FOR 1973
50.00
20.00
-20.00
-50.00
-100.00
1.JAN 1973
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

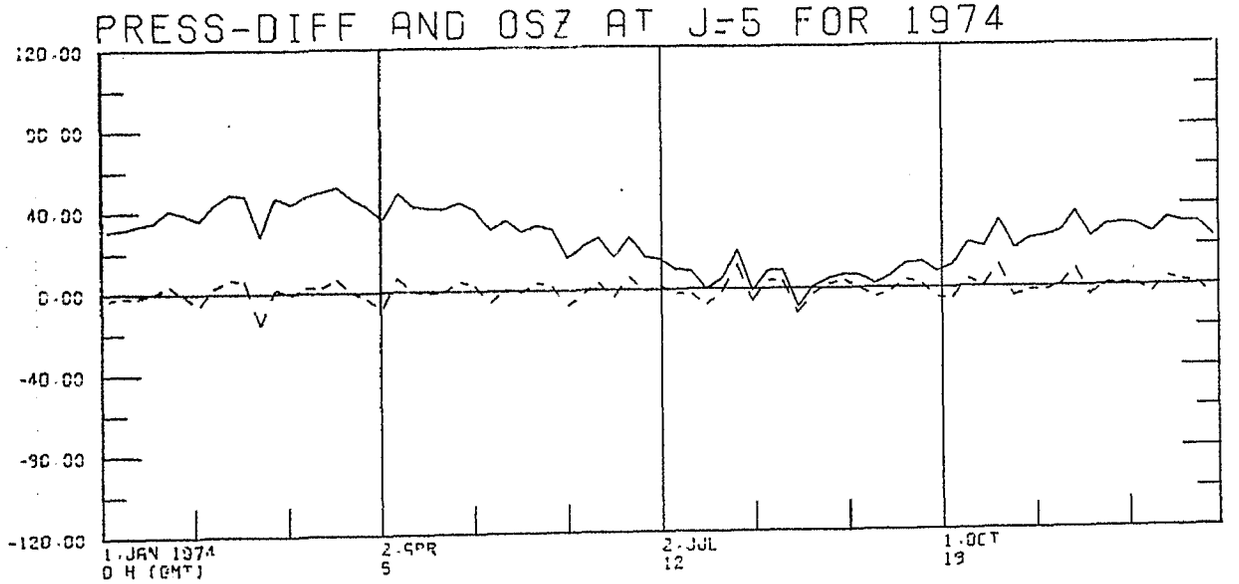

OSZ OF SST AT 30N 15W FOR 1973
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1973
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

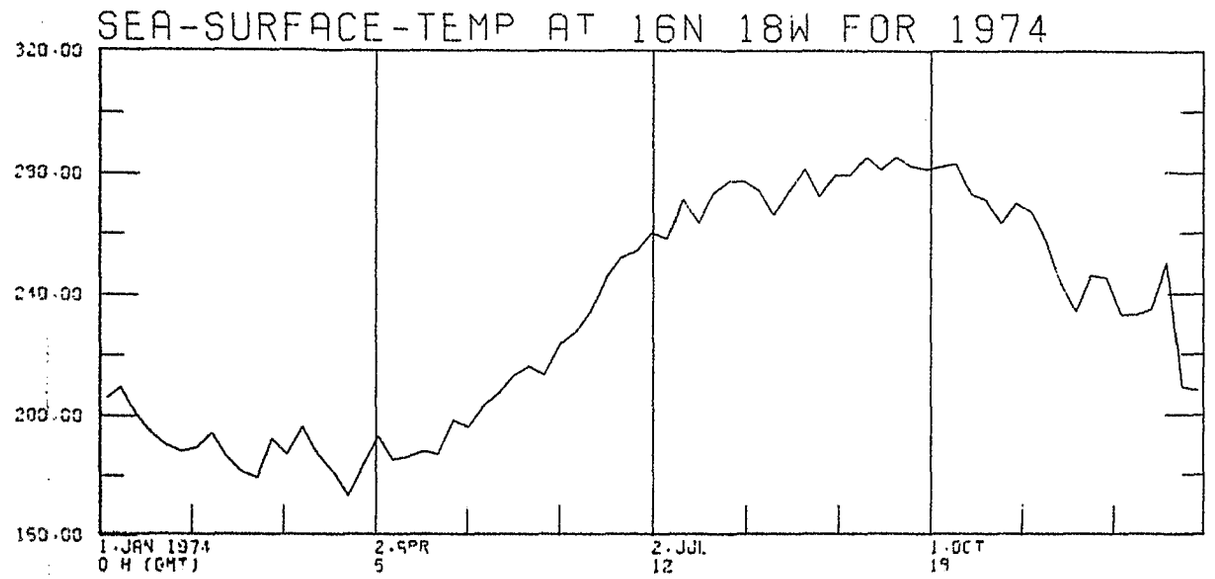

PRESS-DIFF AND OSZ AT J=1 FOR 1974
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1 JAN 1974
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
18

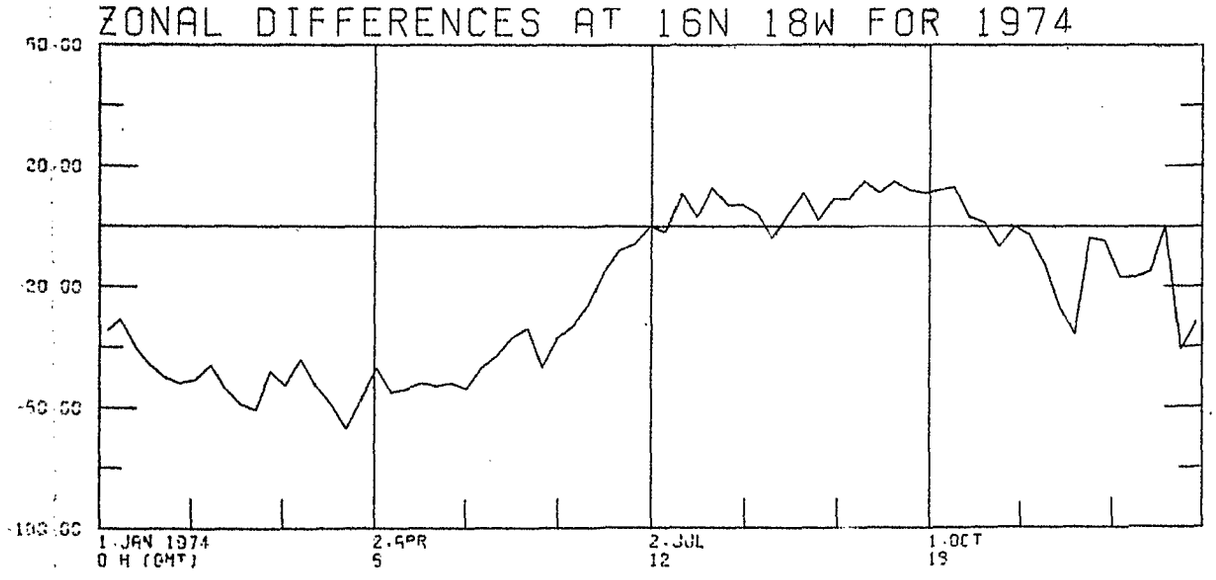

PRESS-DIFF AND OSZ AT J=2 FOR 1974
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1 JAN 1974
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
18

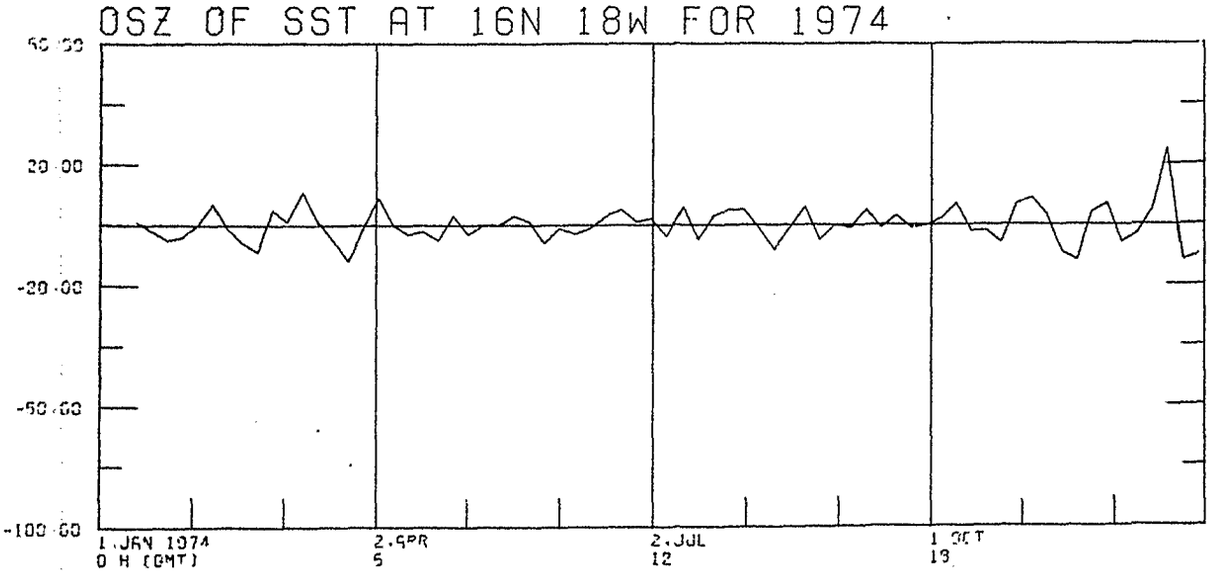

PRESS-DIFF AND OSZ AT J=3 FOR 1974
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1 JAN 1974
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
18

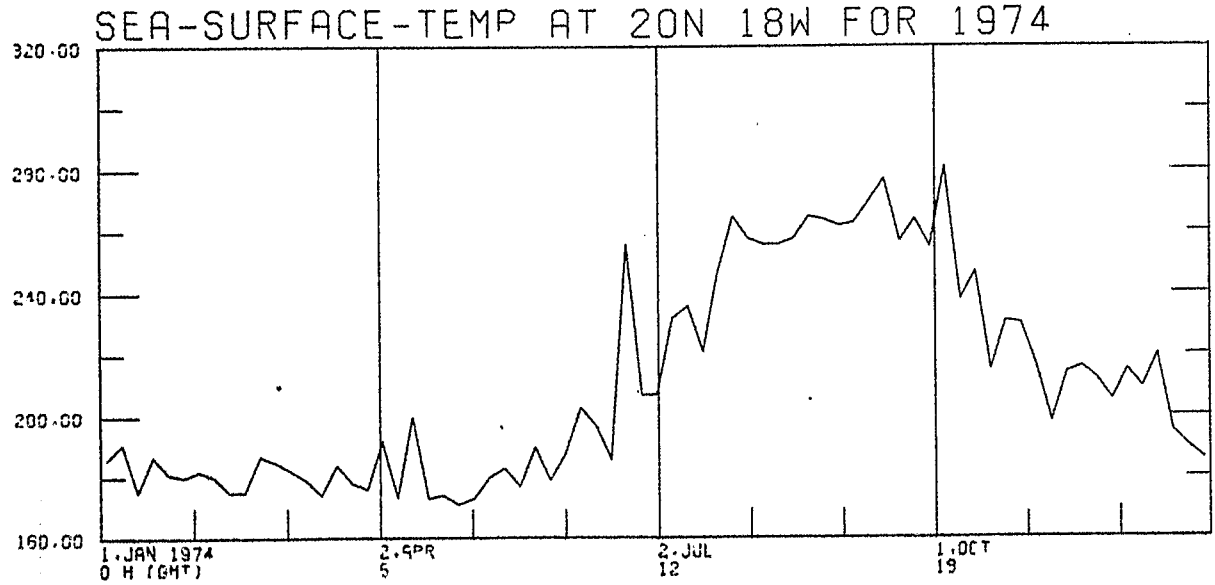

PRESS-DIFF AND OSZ AT J=4 FOR 1974
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1 JAN 1974
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

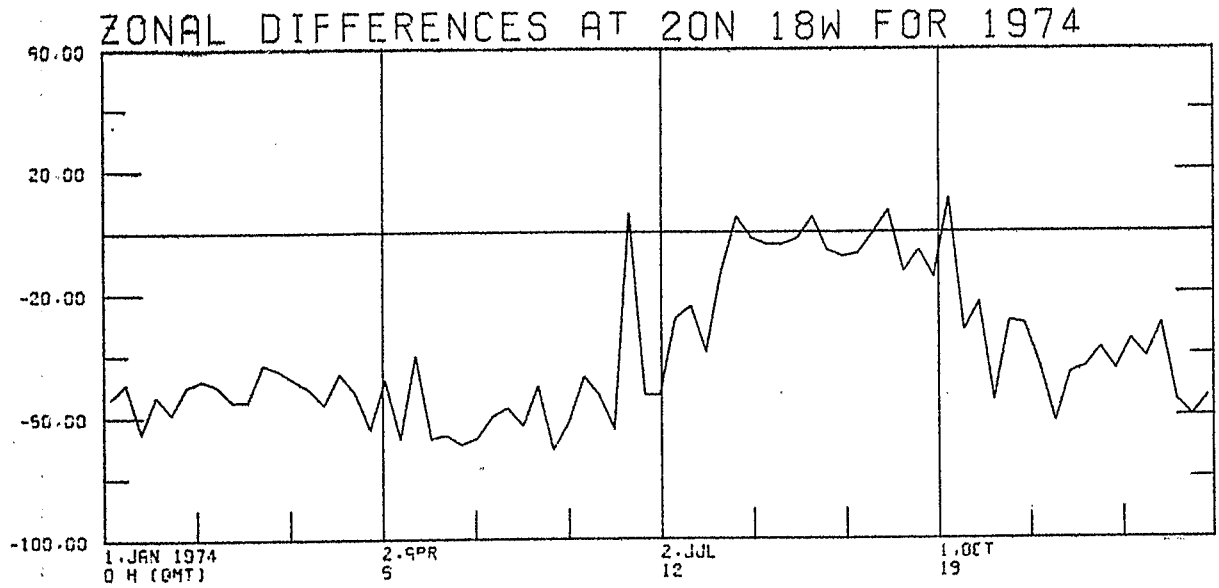

PRESS-DIFF AND OSZ AT J=5 FOR 1974
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1 JAN 1974
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

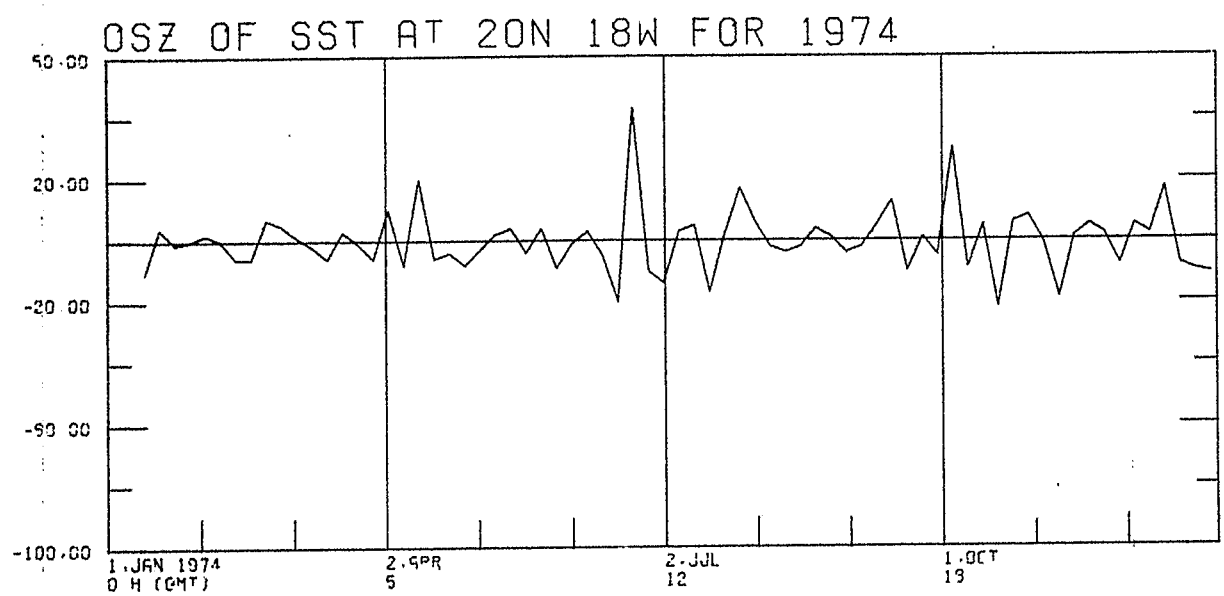

SEA-SURFACE-TEMP AT 16N 18W FOR 1974
320.00
280.00
240.00
200.00
160.00
1 JAN 1974
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

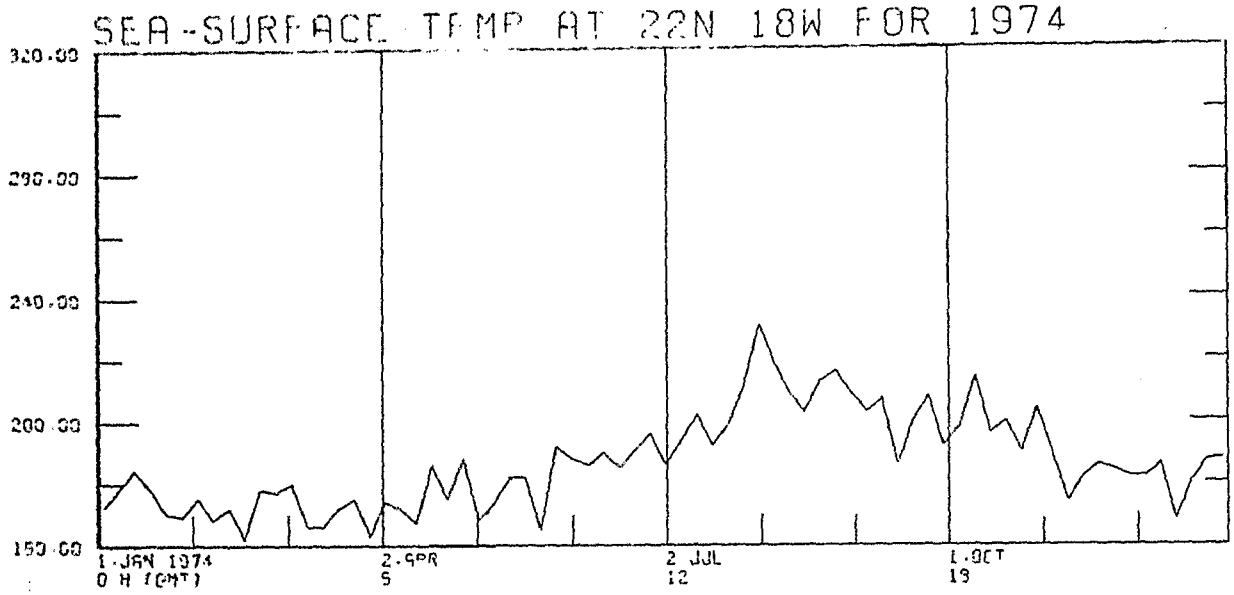

ZONAL DIFFERENCES AT 16N 18W FOR 1974
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1974
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

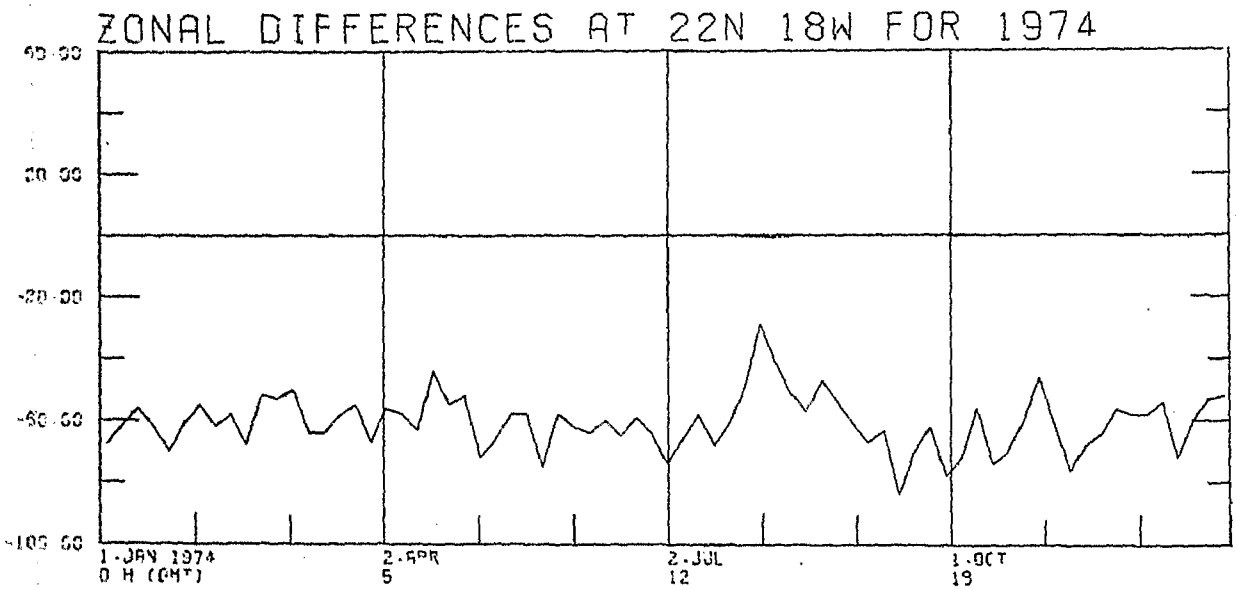

OSZ OF SST AT 16N 18W FOR 1974
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1974
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

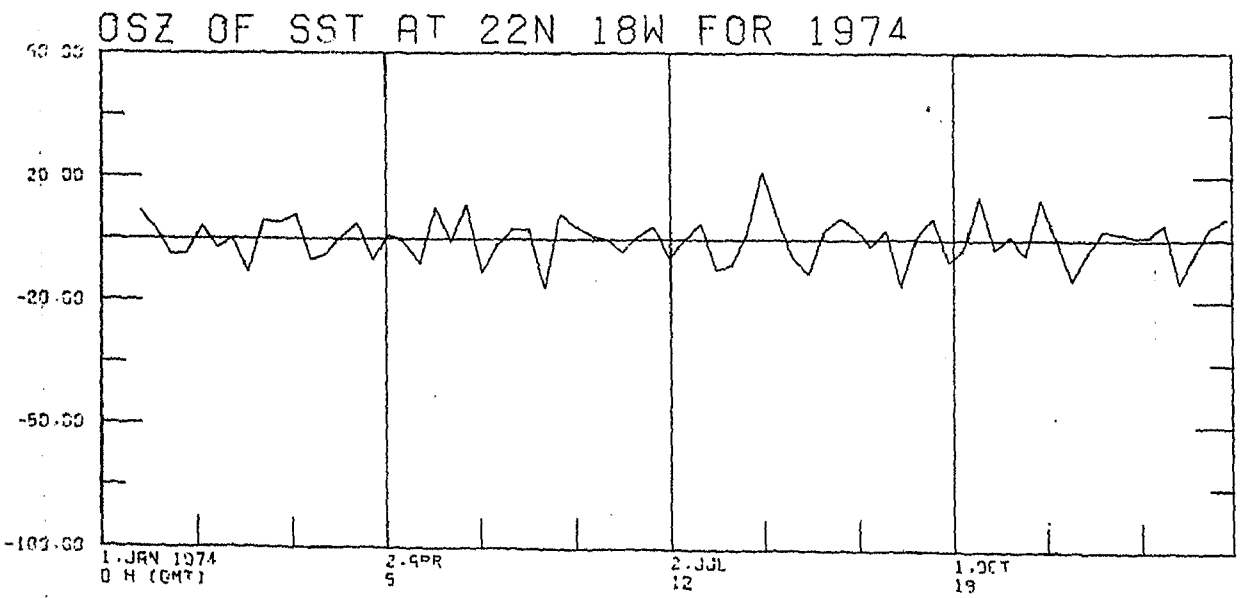

SEA-SURFACE-TEMP AT 20N 18W FOR 1974
320.00
280.00
240.00
200.00
160.00
1.JAN 1974
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

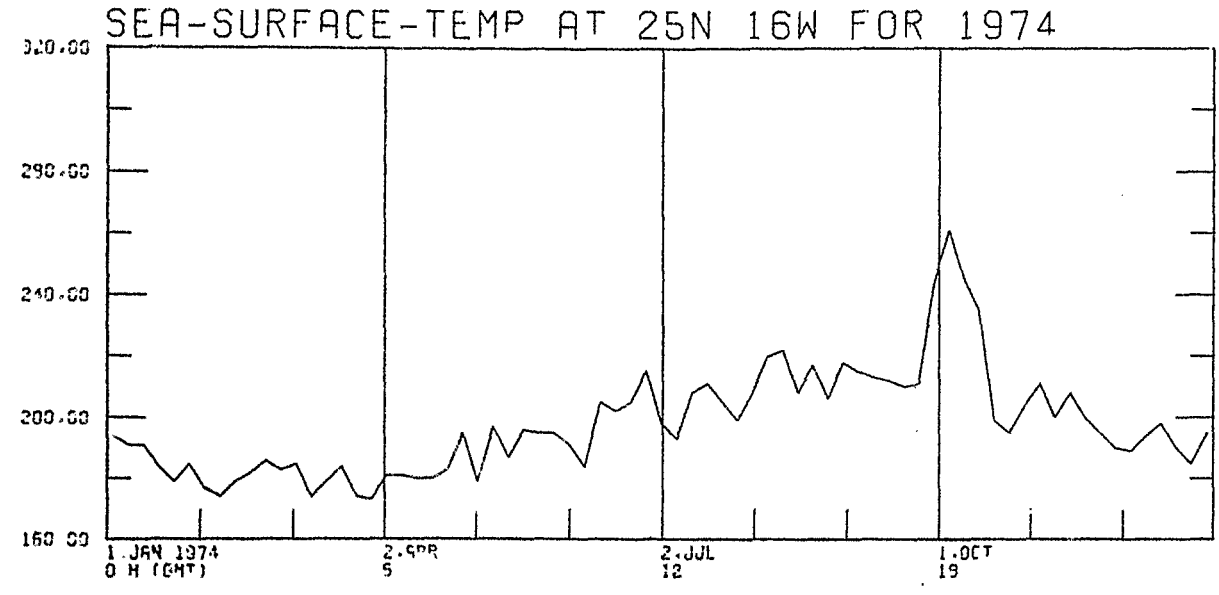

ZONAL DIFFERENCES AT 20N 18W FOR 1974
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1974
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

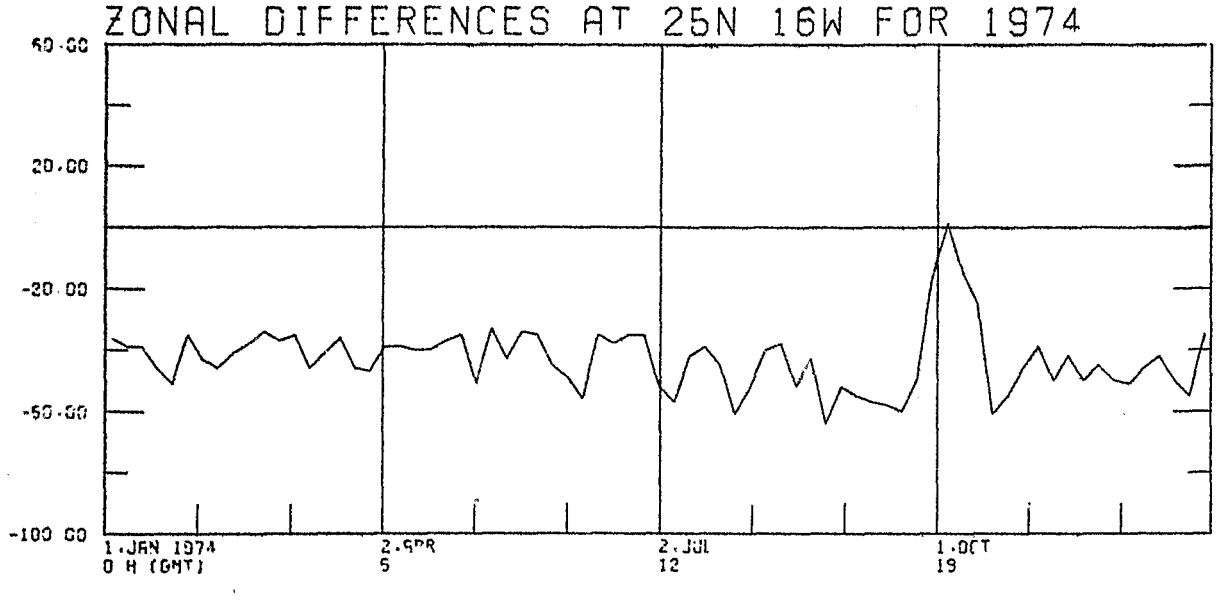

OSZ OF SST AT 20N 18W FOR 1974
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1974
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

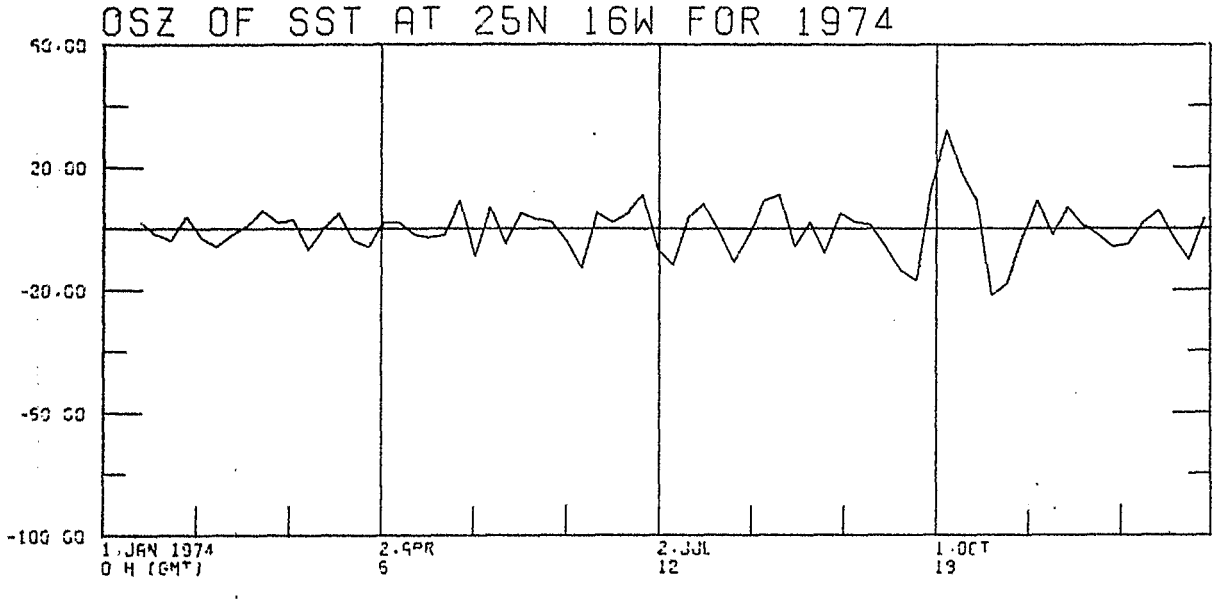

SEA-SURFACE TEMP AT 22N 18W FOR 1974
320.00
280.00
240.00
200.00
150.00
1 JAN 1974
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
18

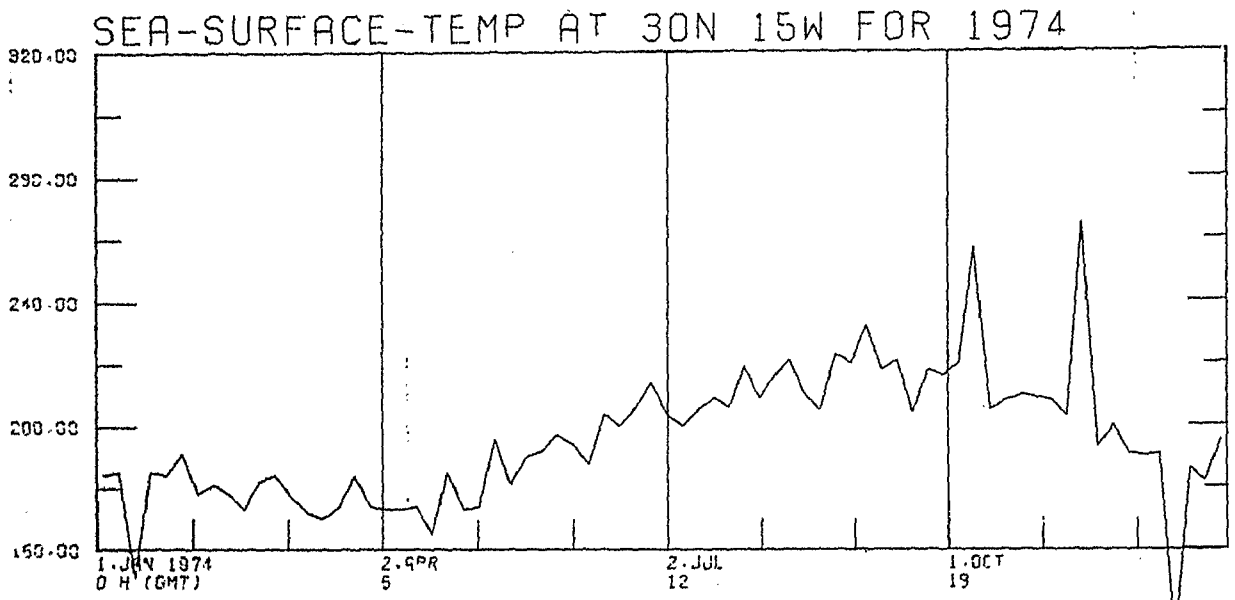

ZONAL DIFFERENCES AT 22N 18W FOR 1974
40.00
20.00
-20.00
-60.00
-100.00
1 JAN 1974
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
18

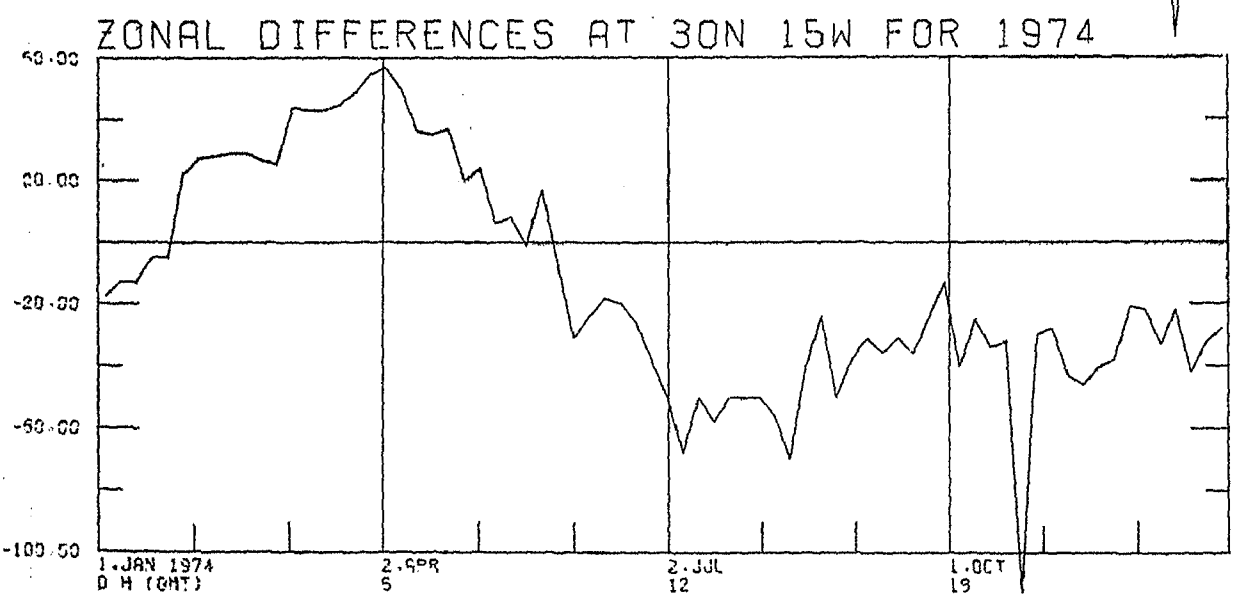

OSZ OF SST AT 22N 18W FOR 1974
60.00
20.00
-20.00
-50.00
-100.00
1 JAN 1974
0 H (GMT)
2 APR
6
2 JUL
12
1 OCT
18

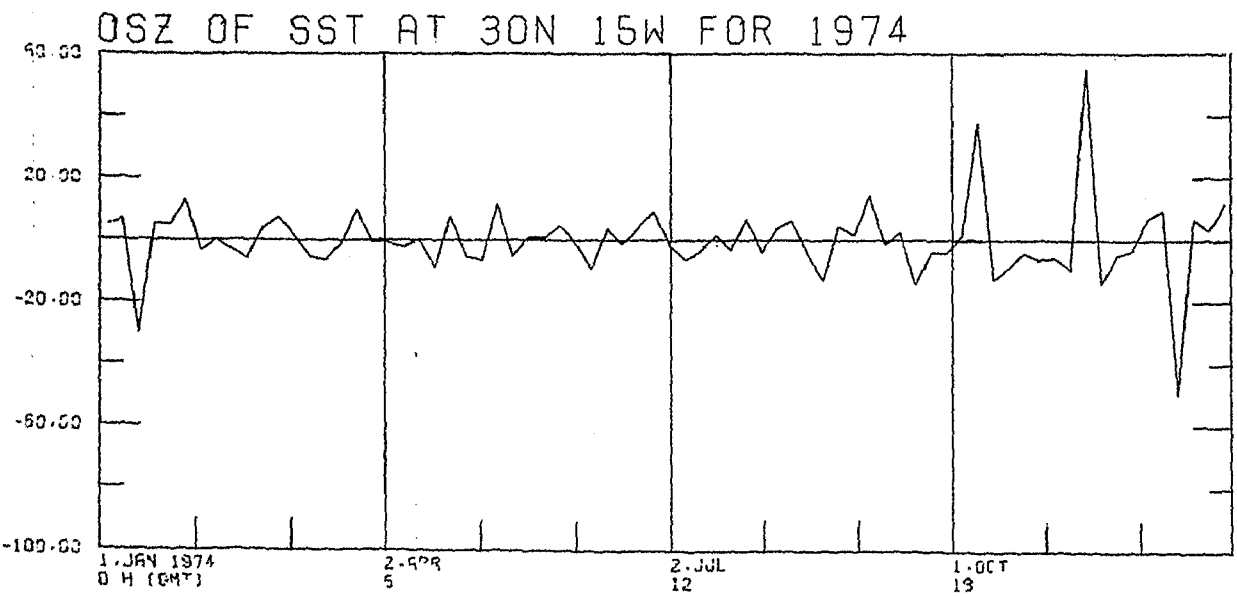

SEA-SURFACE-TEMP AT 25N 16W FOR 1974
320.00
280.00
240.00
200.00
160.00
1.JAN 1974
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

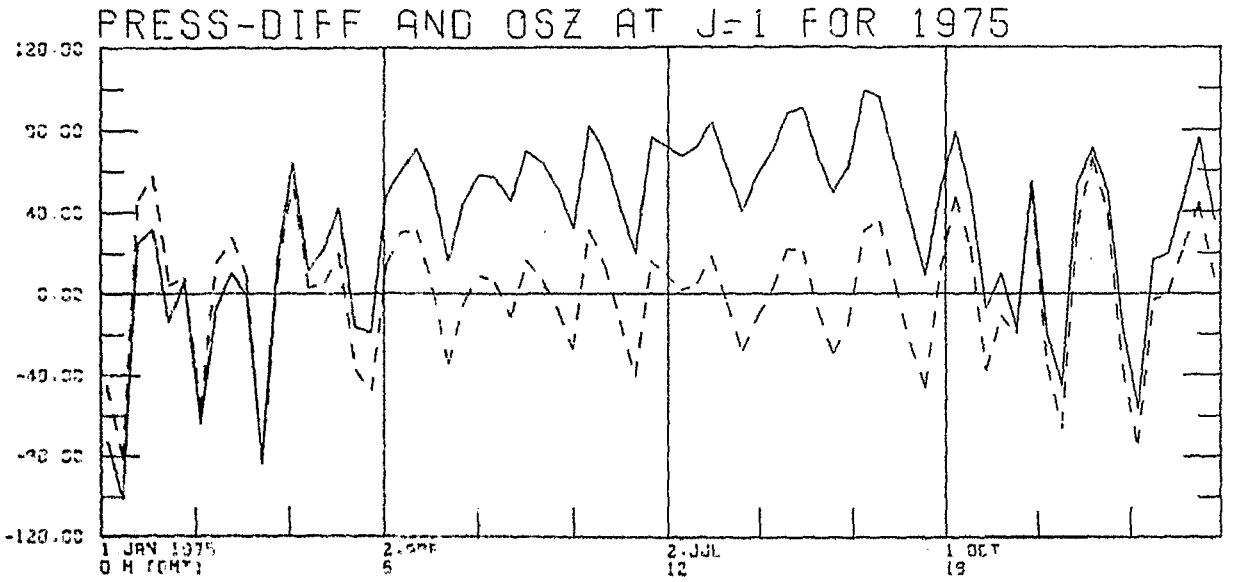

ZONAL DIFFERENCES AT 25N 16W FOR 1974
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1974
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

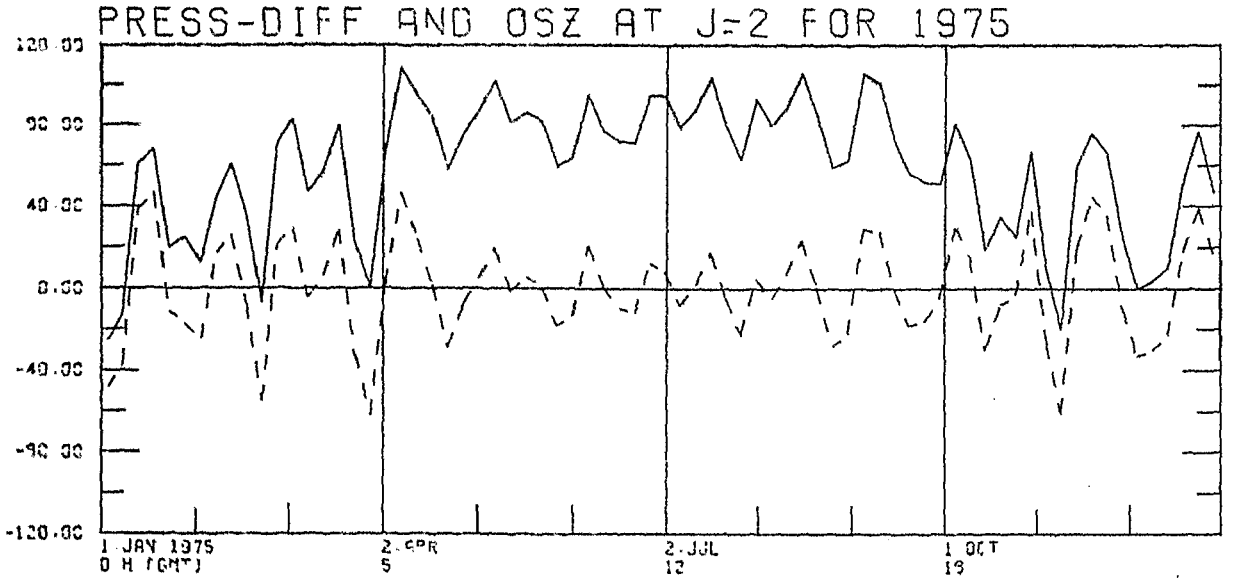

OSZ OF SST AT 25N 16W FOR 1974
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1974
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

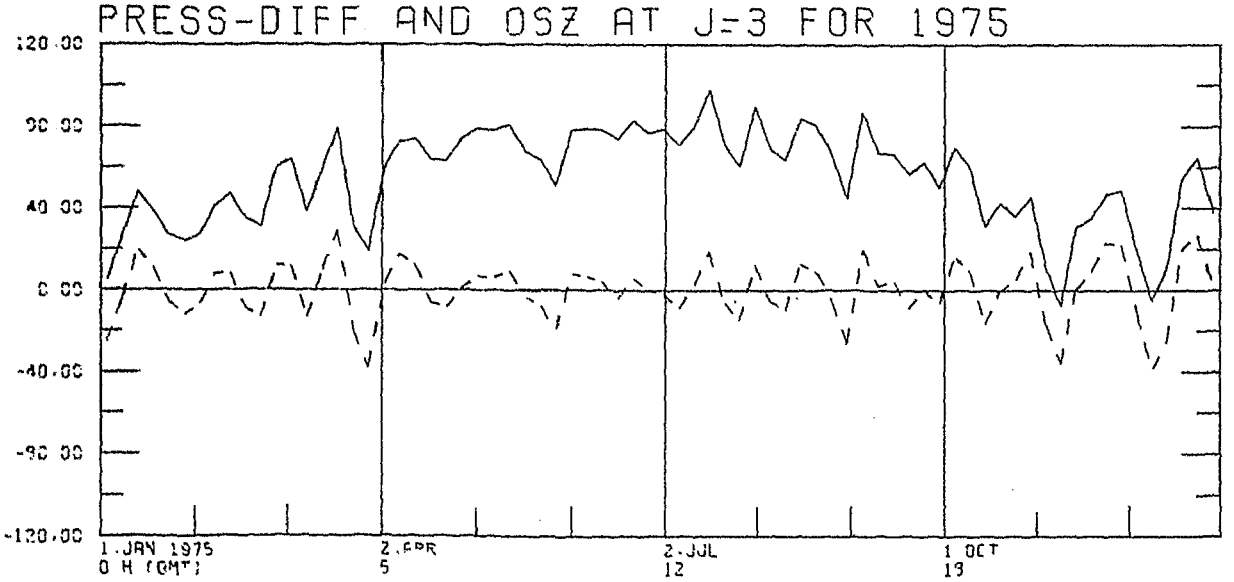

SEA-SURFACE-TEMP AT 30N 15W FOR 1974
320.00
280.00
240.00
200.00
160.00
1 JAN 1974
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

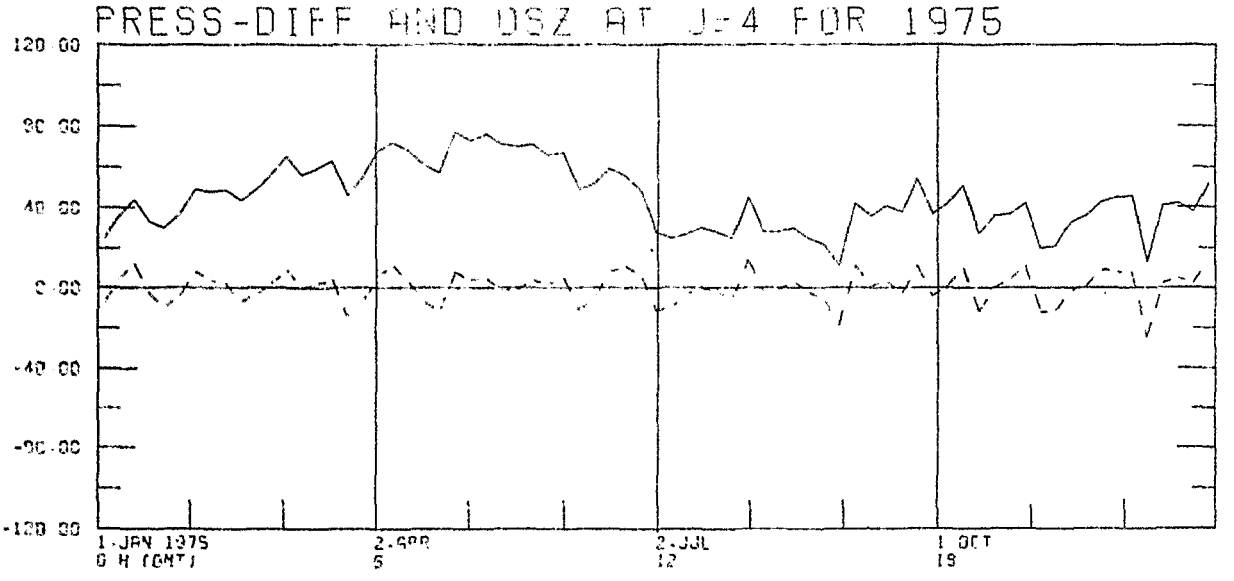

ZONAL DIFFERENCES AT 30N 15W FOR 1974
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1974
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

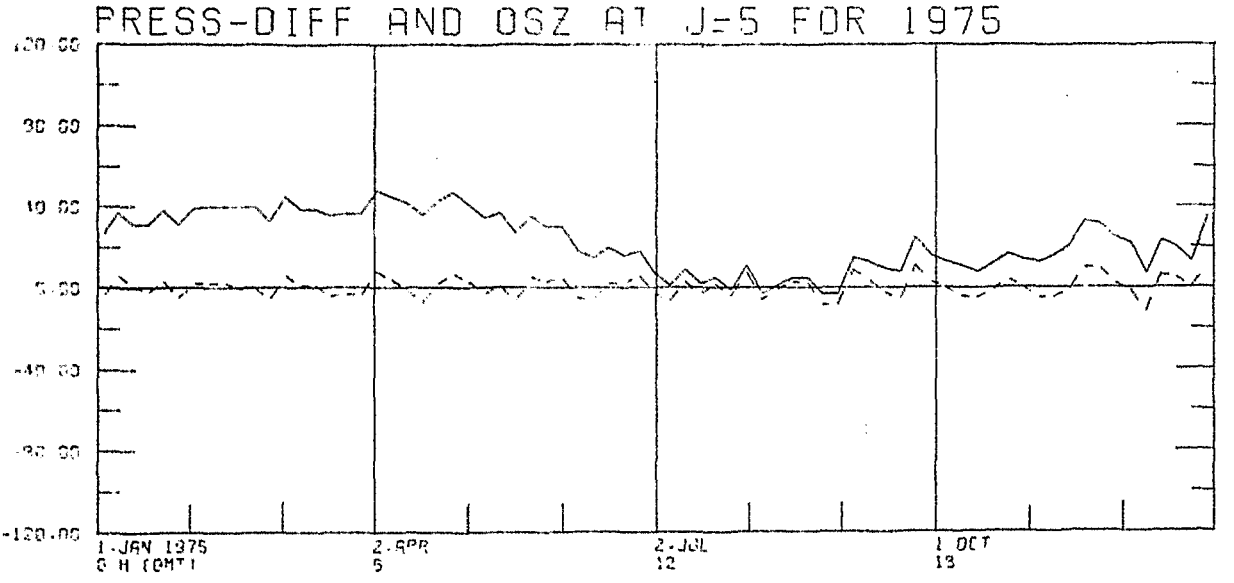

OSZ OF SST AT 30N 15W FOR 1974
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1974
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

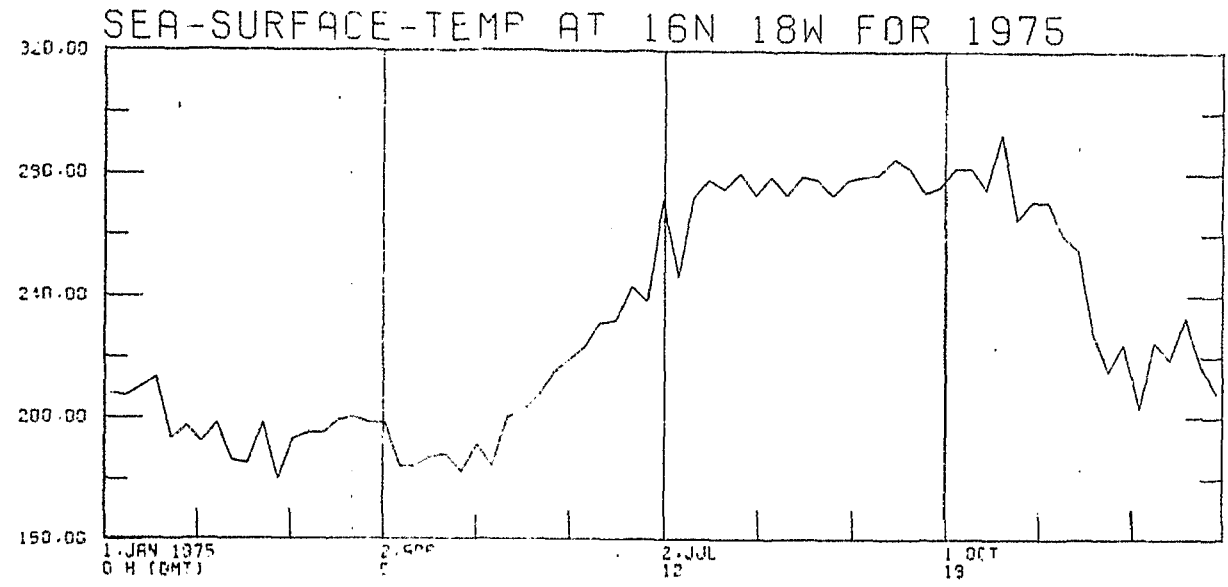

PRESS-DIFF AND OSZ AT J=1 FOR 1975
120.00
90.00
40.00
0.00
-40.00
-90.00
-120.00
1 JAN 1975
0 H (GMT)
2.APR
5
2.JUL
12
1 OCT
19

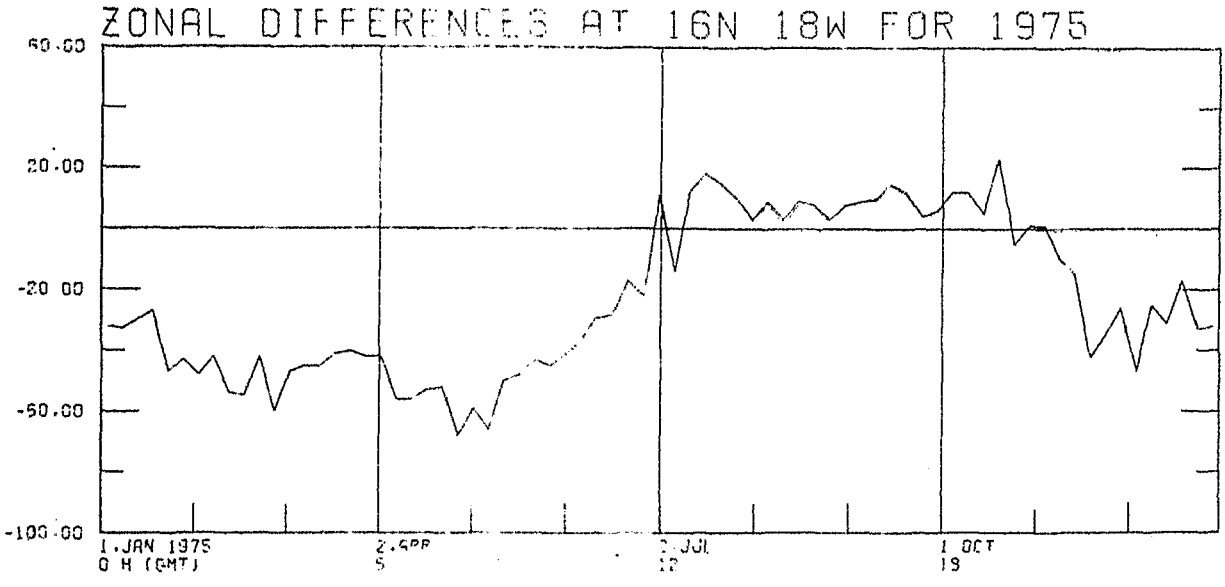

PRESS-DIFF AND OSZ AT J=2 FOR 1975
120.00
90.00
40.00
0.00
-40.00
-90.00
-120.00
1 JAN 1975
0 H (GMT)
2.APR
5
2.JUL
12
1 OCT
19

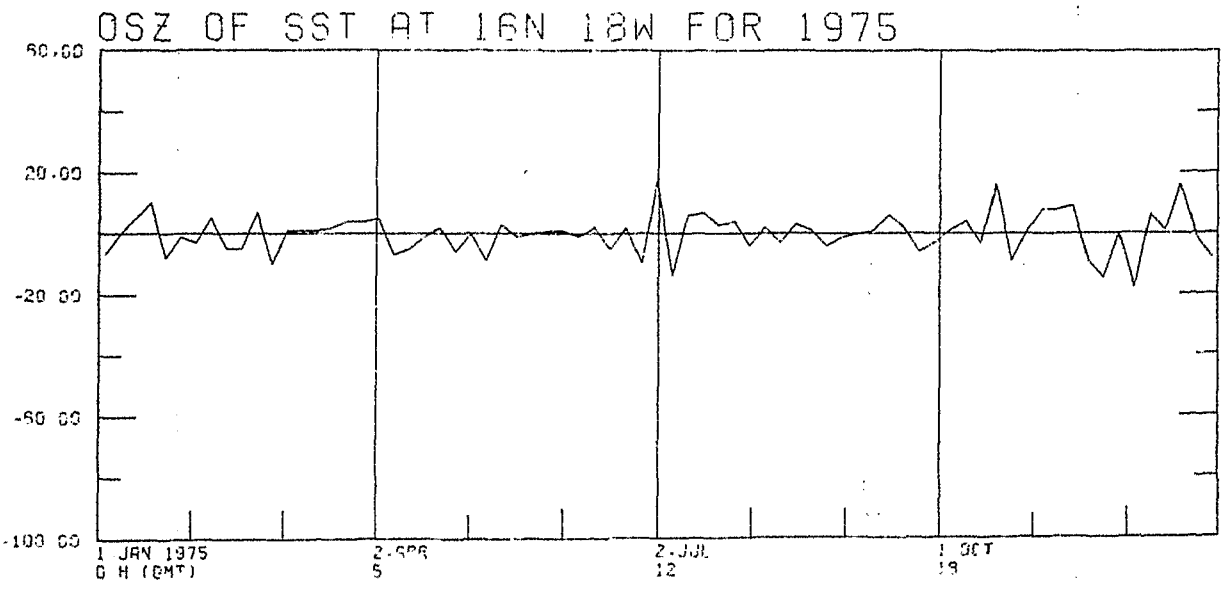

PRESS-DIFF AND OSZ AT J=3 FOR 1975
120.00
90.00
40.00
0.00
-40.00
-90.00
-120.00
1 JAN 1975
0 H (GMT)
2.APR
5
2.JUL
12
1 OCT
19

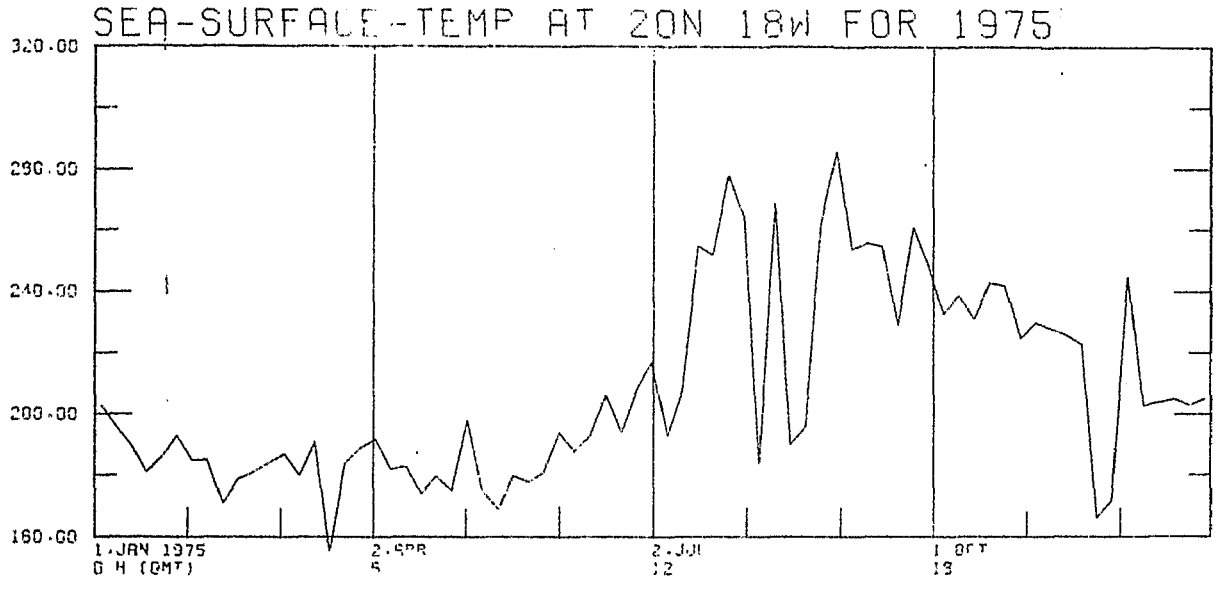

PRESS-DIFF AND DSZ AT J=4 FOR 1975
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1-JAN 1975
0 H (GMT)
2-APR
6
2-JUL
12
1 OCT
18

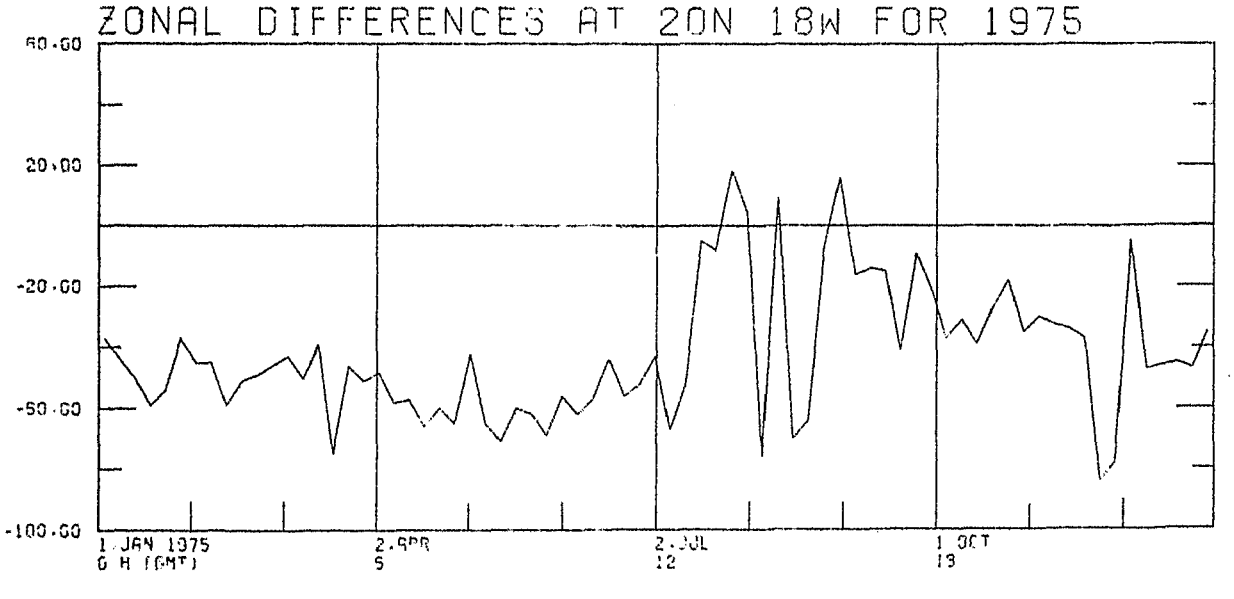

PRESS-DIFF AND DSZ AT J=5 FOR 1975
80.00
40.00
0.00
-40.00
-80.00
-120.00
1-JAN 1975
0 H (GMT)
2-APR
6
2-JUL
12
1 OCT
18

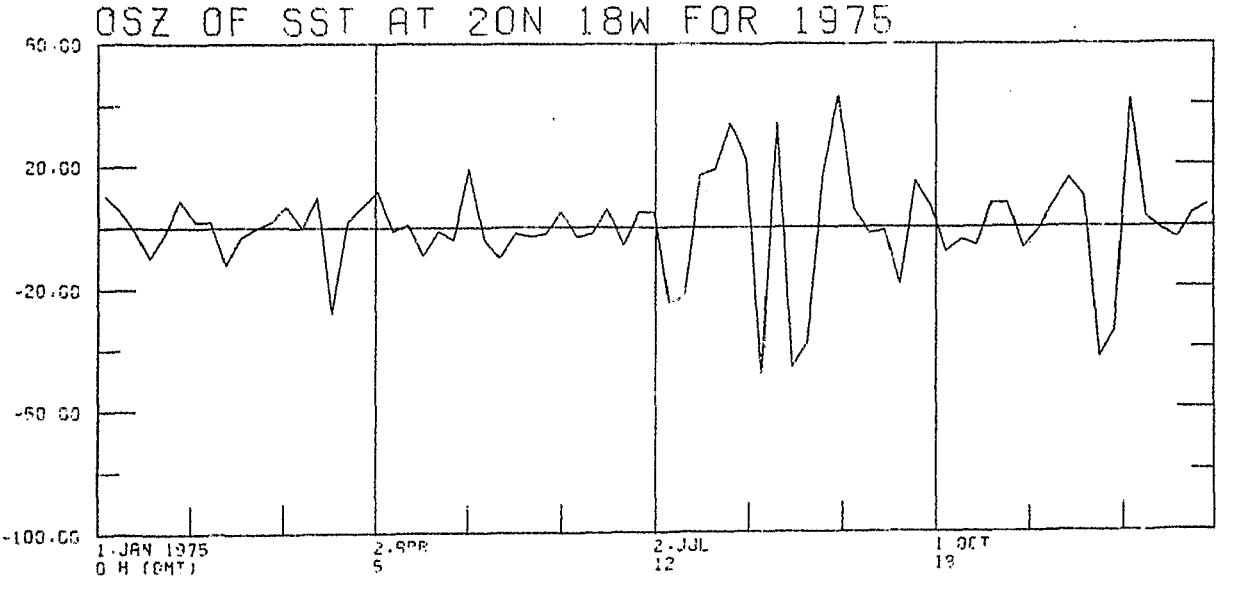

SEA-SURFACE-TEMP AT 16N 18W FOR 1975
320.00
280.00
240.00
200.00
160.00
1 JAN 1975
0 H (GMT)
2 JUL
12
1 OCT
19

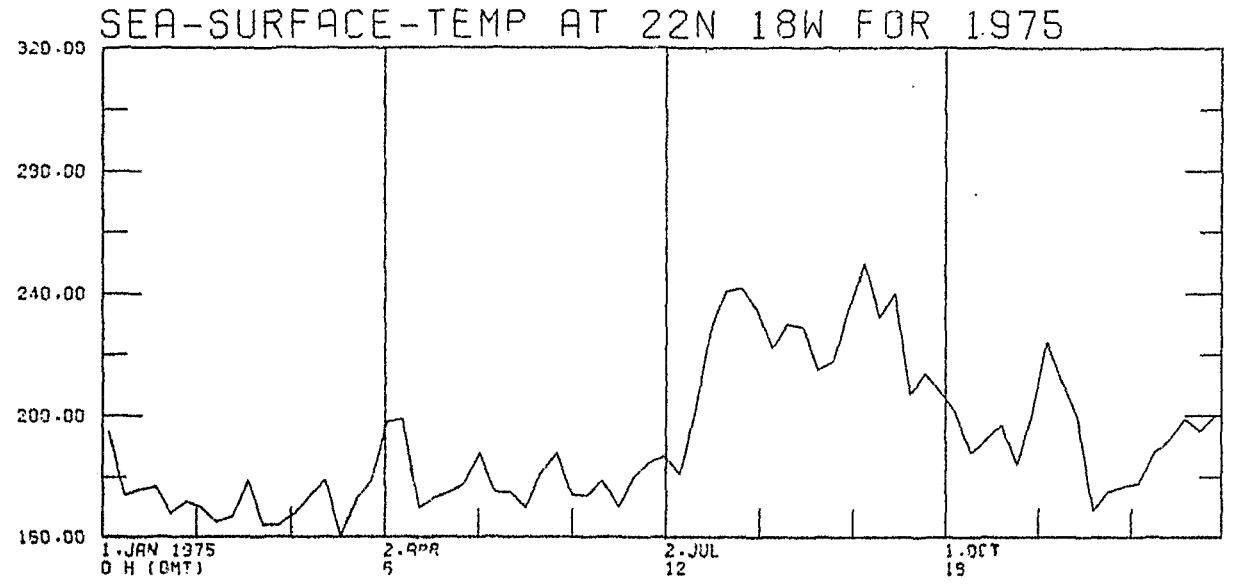

ZONAL DIFFERENCES AT 16N 18W FOR 1975
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1975
0 H (GMT)
2 JUL
12
1 OCT
19

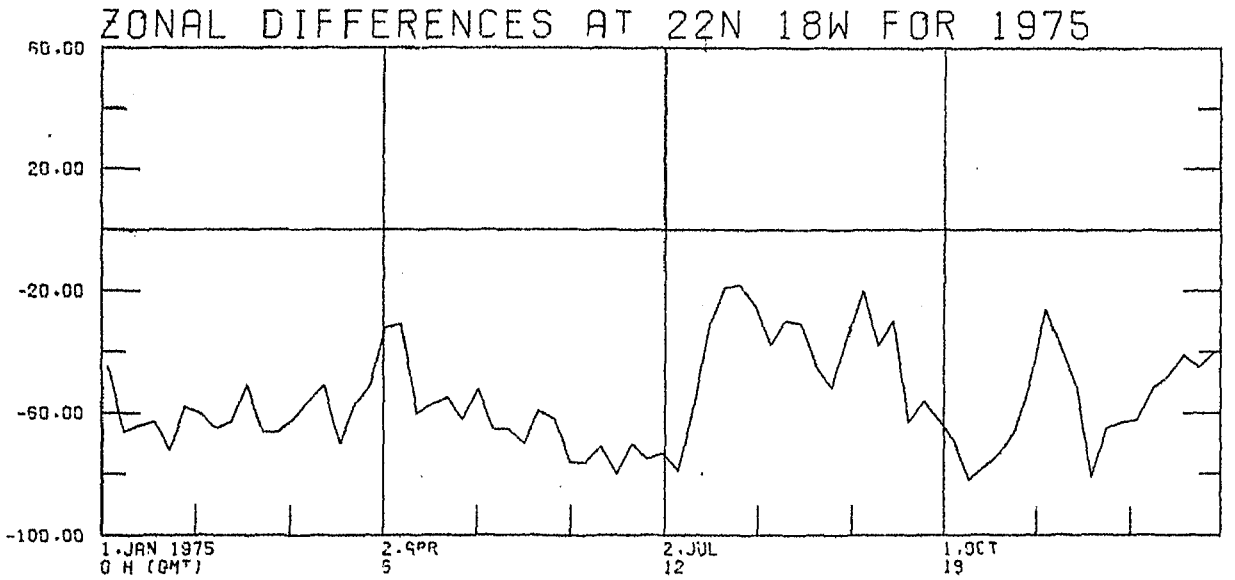

OSZ OF SST AT 16N 18W FOR 1975
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1975
0 H (GMT)
2 JUL
12
1 OCT
19

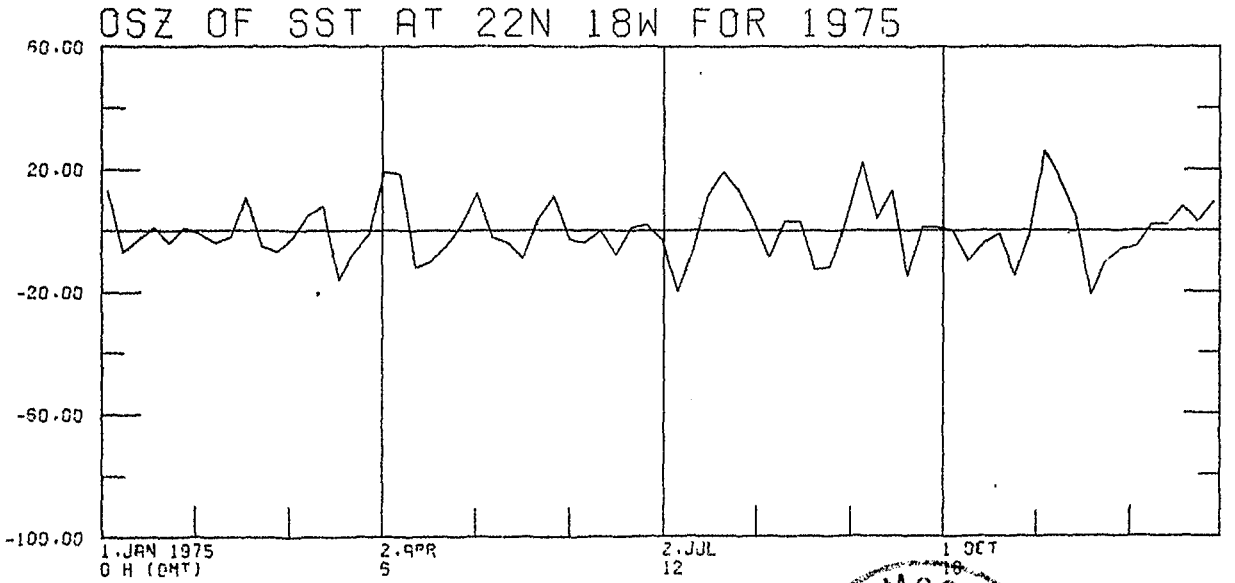

SEA-SURFACE-TEMP AT 20N 18W FOR 1975
320.00
280.00
240.00
200.00
160.00
1 JAN 1975
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

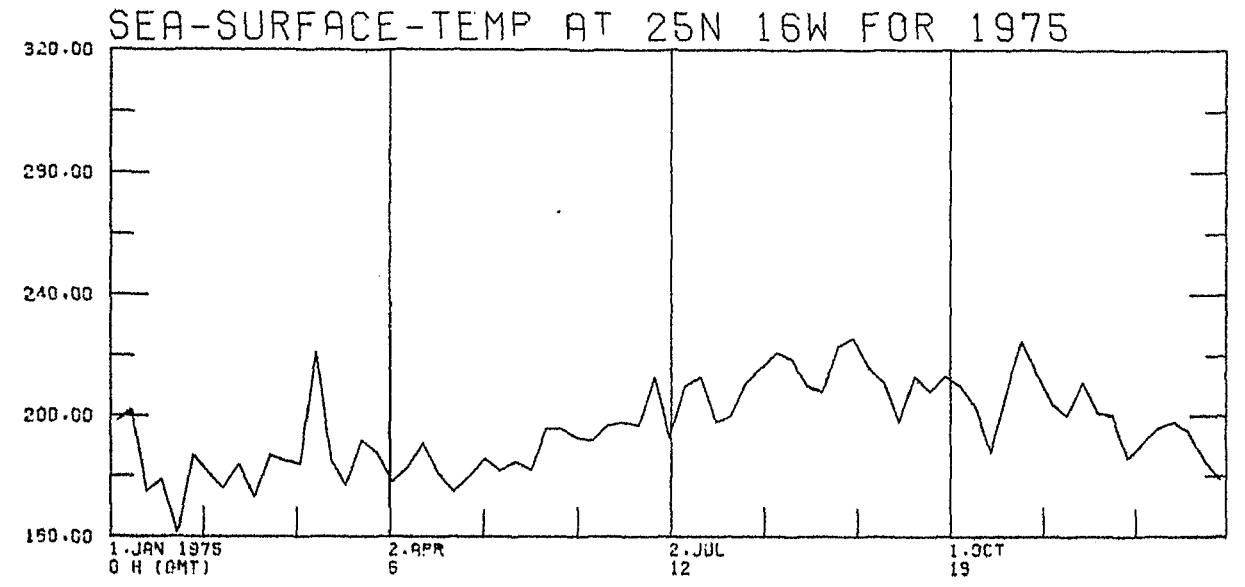

ZONAL DIFFERENCES AT 20N 18W FOR 1975
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1975
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

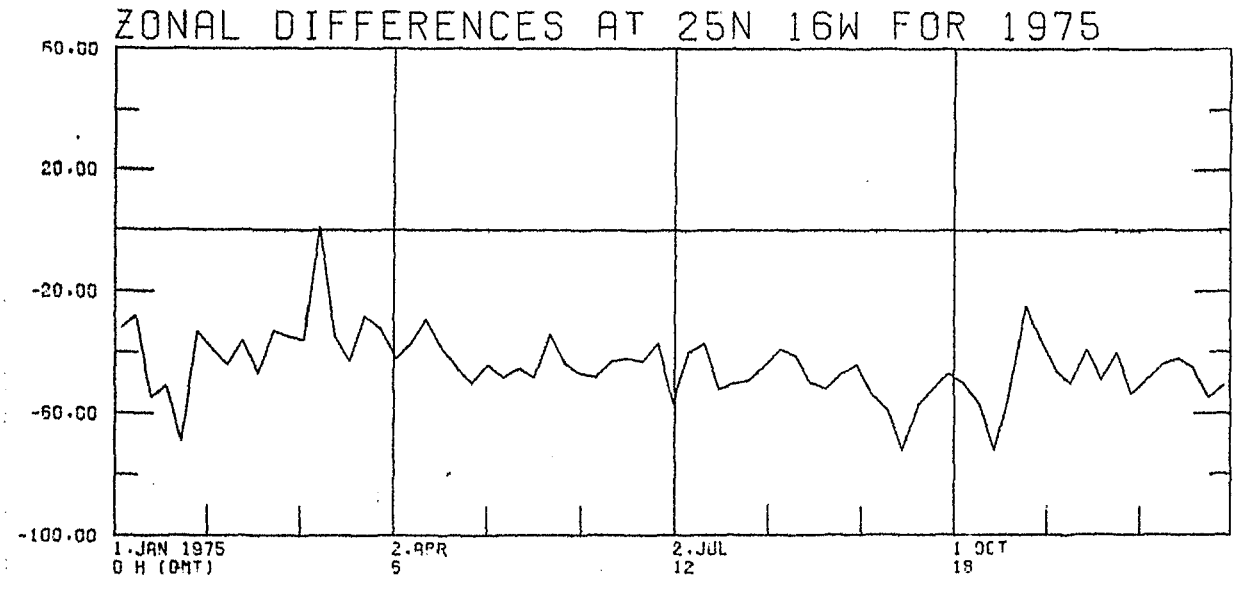

OSZ OF SST AT 20N 18W FOR 1975
60.00
20.00
-20.00
-60.00
-100.00
1 JAN 1975
0 H (GMT)
2 APR
5
2 JUL
12
1 OCT
19

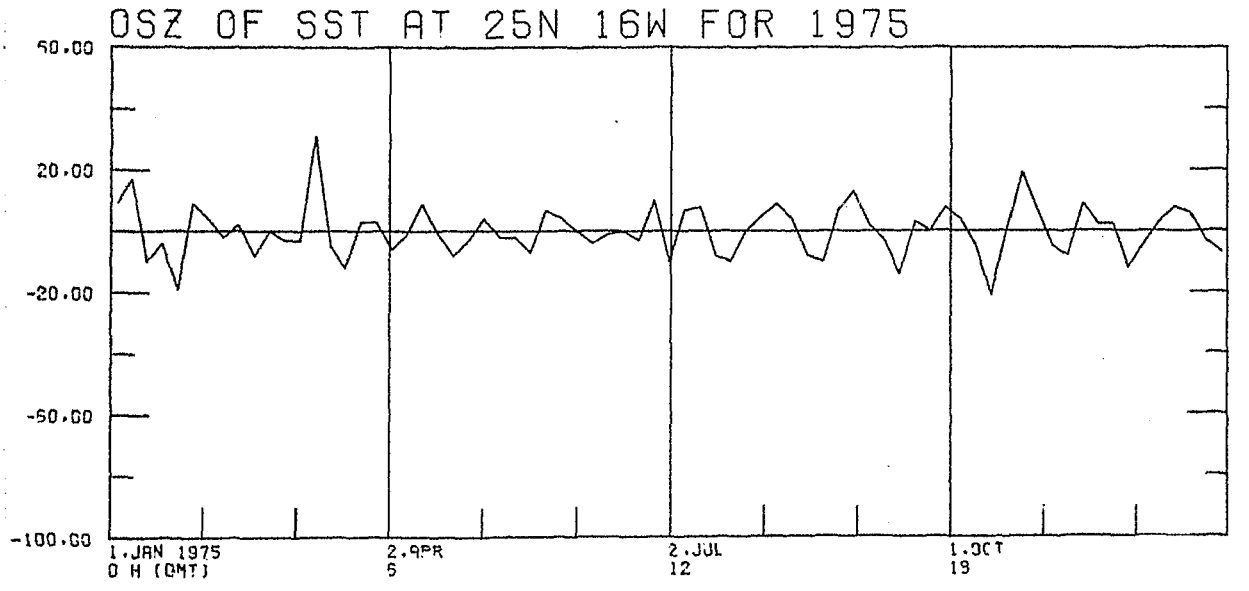


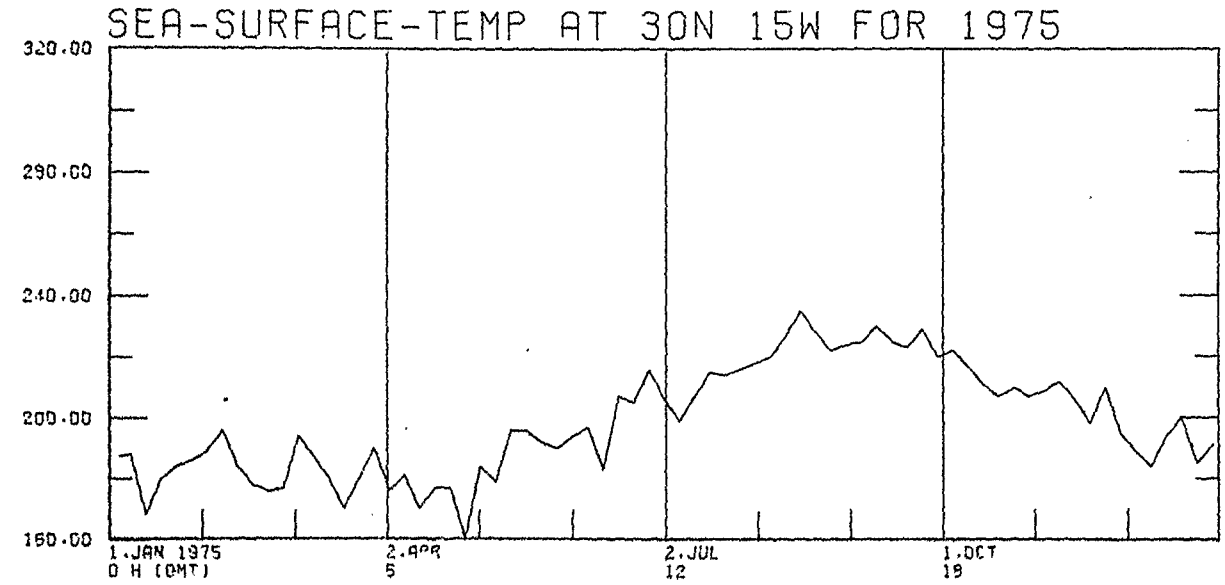


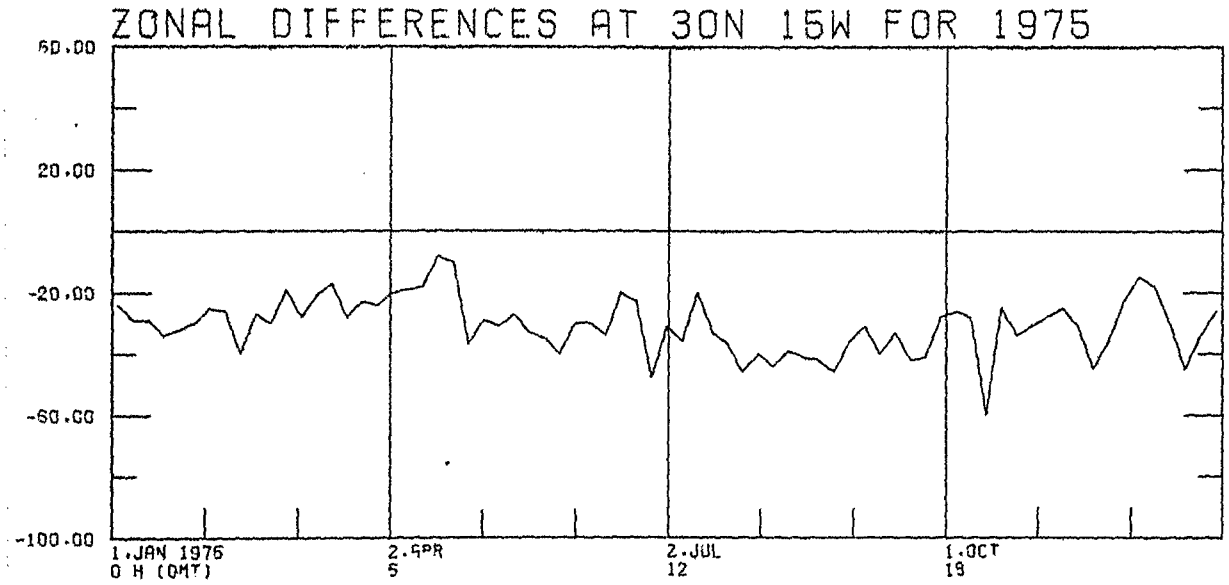


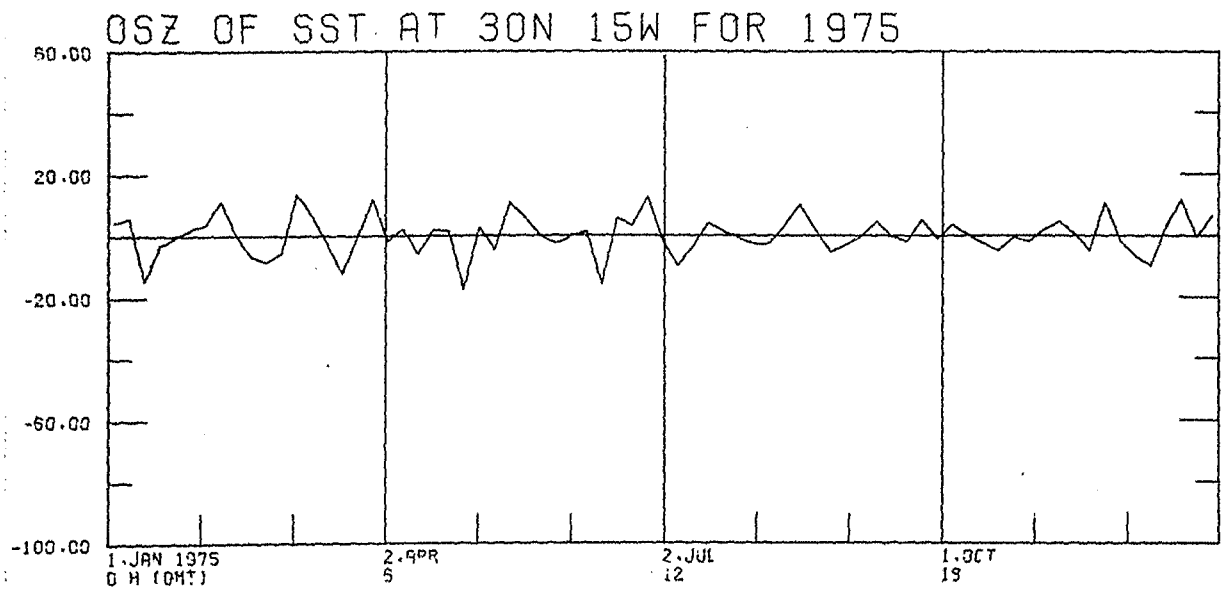

SEA-SURFACE-TEMP AT 25N 16W FOR 1975
320.00
290.00
240.00
200.00
160.00
[1/100C]
1.JAN 1975
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
19

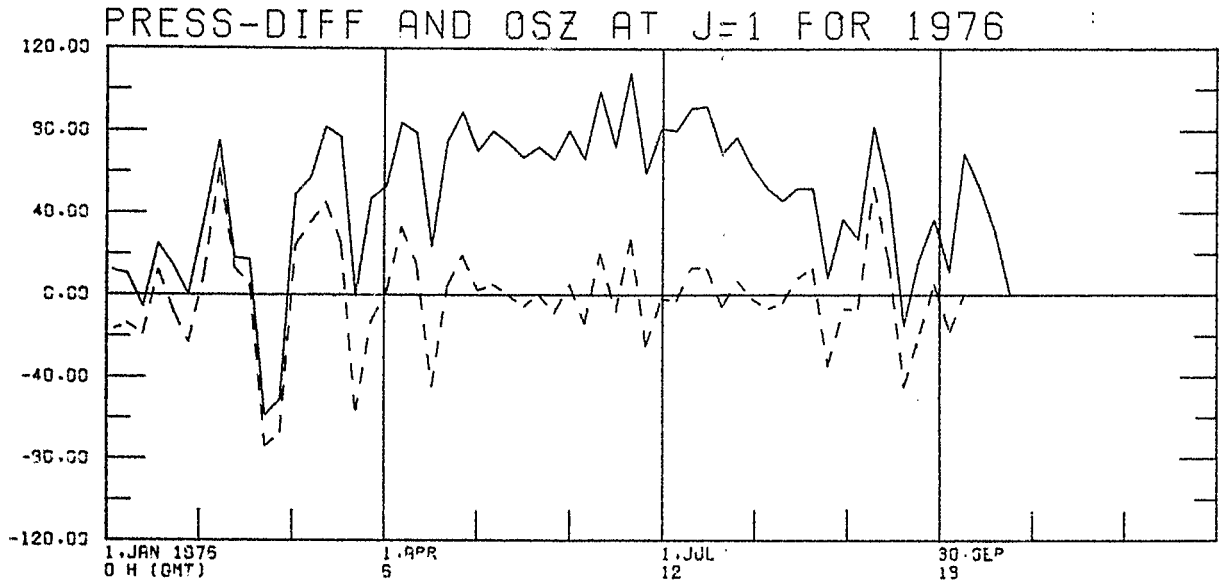

ZONAL DIFFERENCES AT 25N 16W FOR 1975
60.00
20.00
-20.00
-60.00
-100.00
[1/100C]
1.JAN 1975
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
19

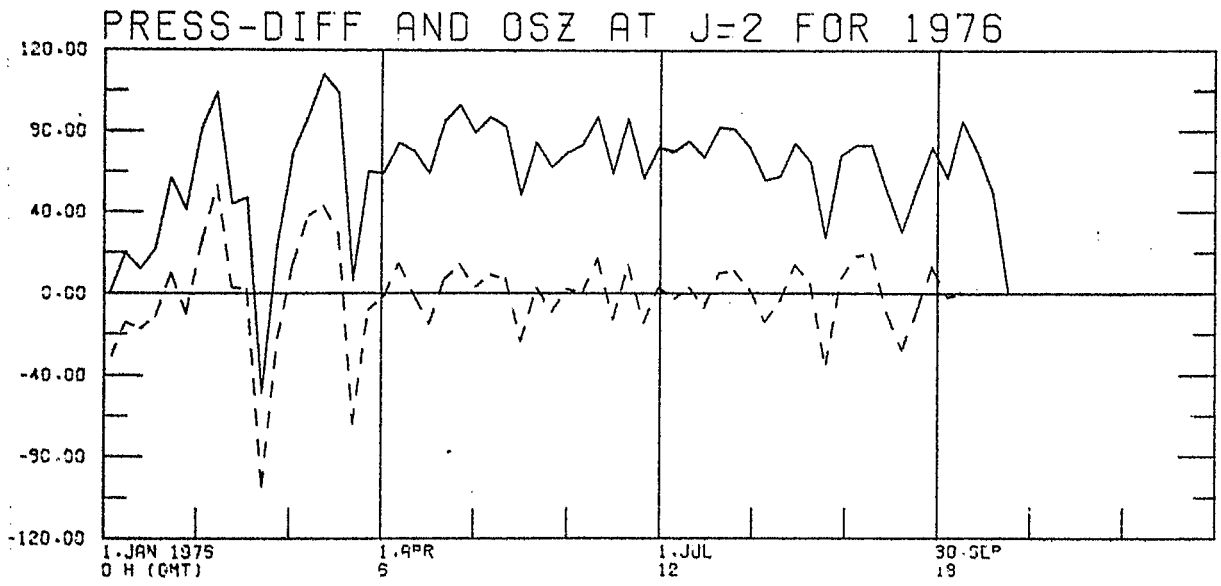

OSZ OF SST AT 25N 16W FOR 1975
60.00
20.00
-20.00
-60.00
-100.00
[1/100C]
1.JAN 1975
0 H (GMT)
2.APR
6
2.JUL
12
1.OCT
19

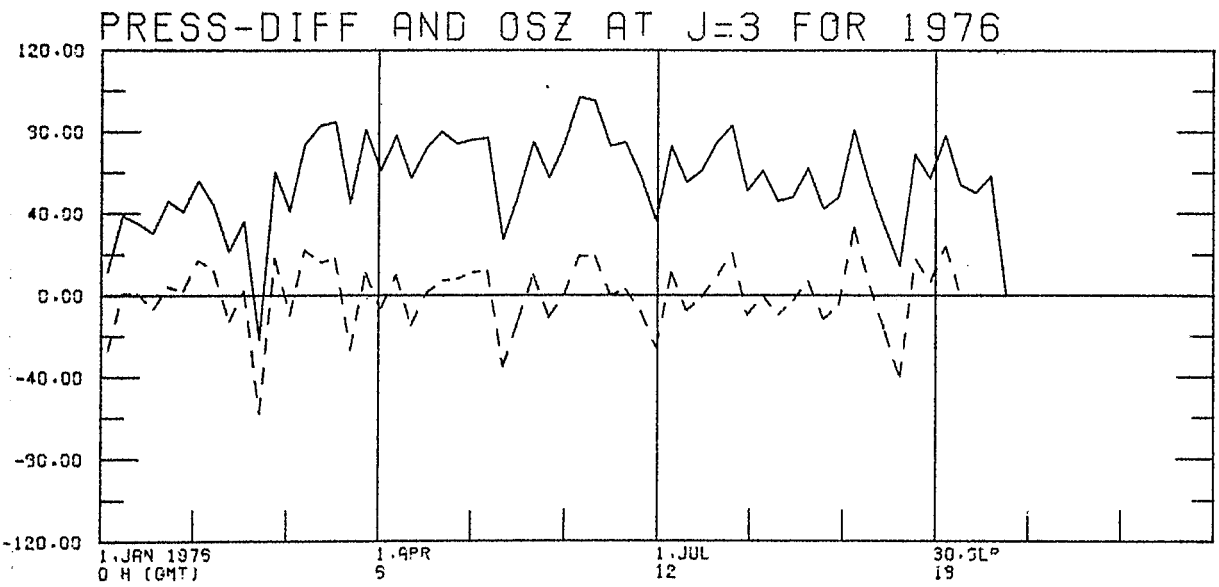

SEA-SURFACE-TEMP AT 30N 15W FOR 1975
320.00
280.00
240.00
200.00
160.00
[1/100C]
1.JAN 1975
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

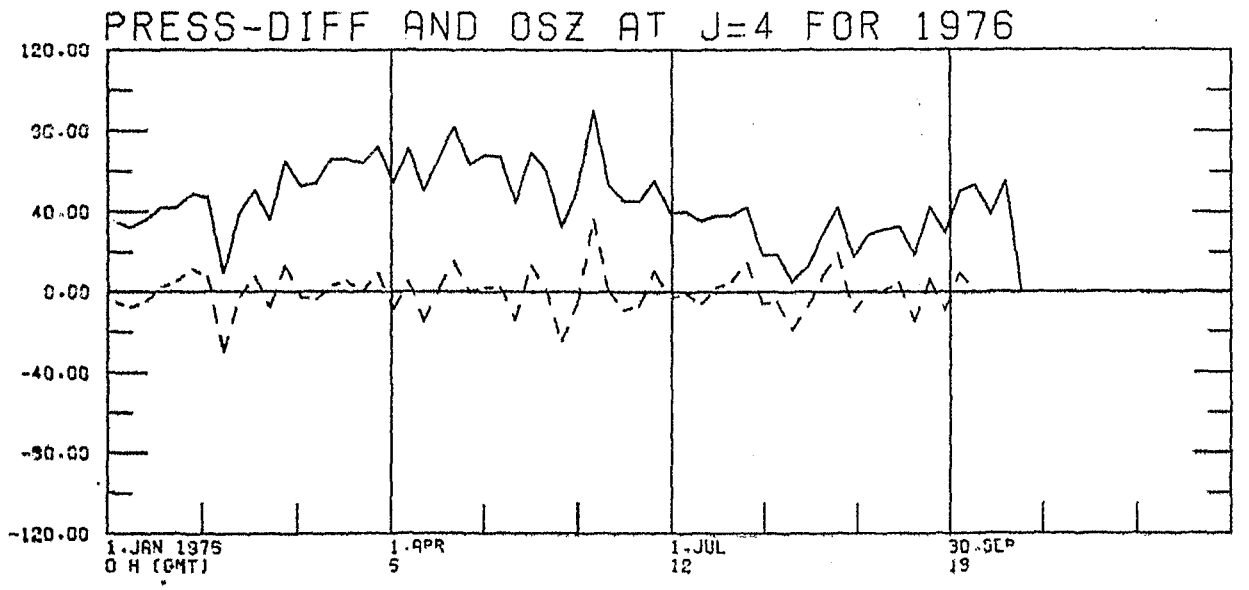

ZONAL DIFFERENCES AT 30N 15W FOR 1975
60.00
20.00
-20.00
-60.00
-100.00
[1/100C]
1.JAN 1975
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

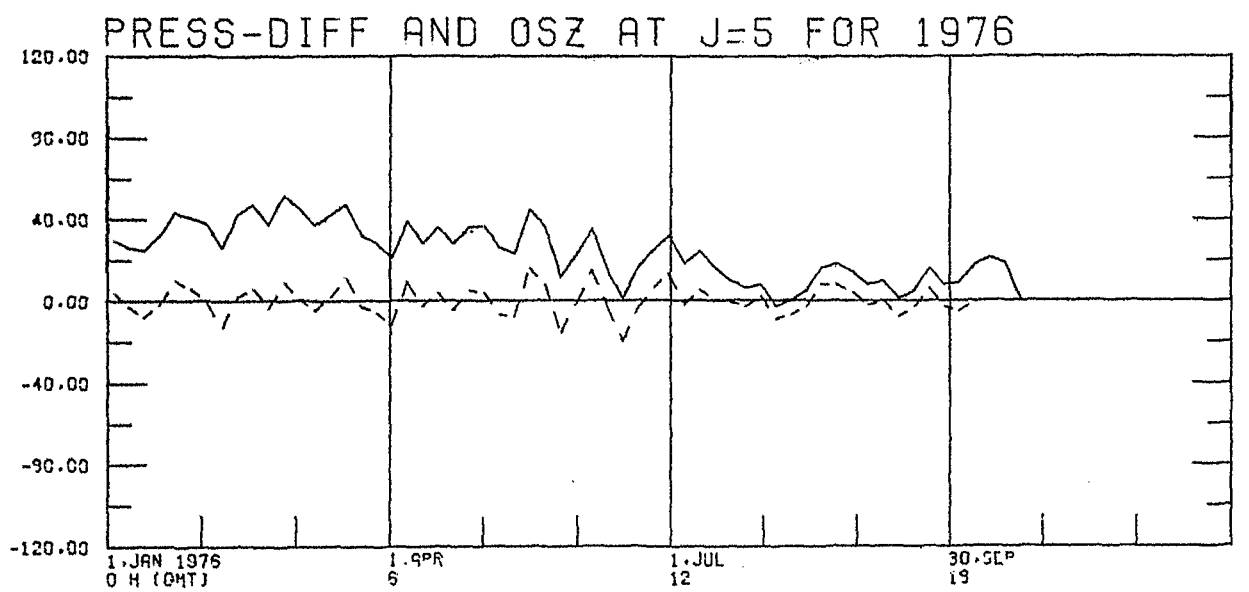

OSZ OF SST AT 30N 15W FOR 1975
60.00
20.00
-20.00
-60.00
-100.00
[1/100C]
1.JAN 1975
0 H (GMT)
2.APR
5
2.JUL
12
1.OCT
19

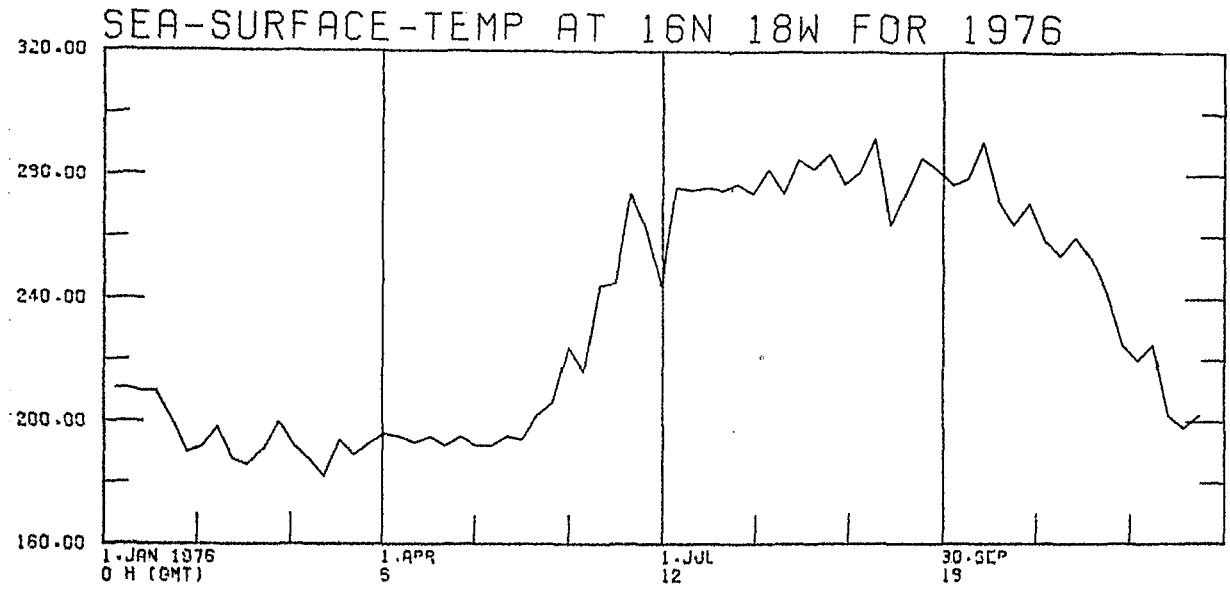

PRESS-DIFF AND OSZ AT J=1 FOR 1976
[1/10MB]
120.00
90.00
40.00
0.00
-40.00
-90.00
-120.00
1.JAN 1976
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
18

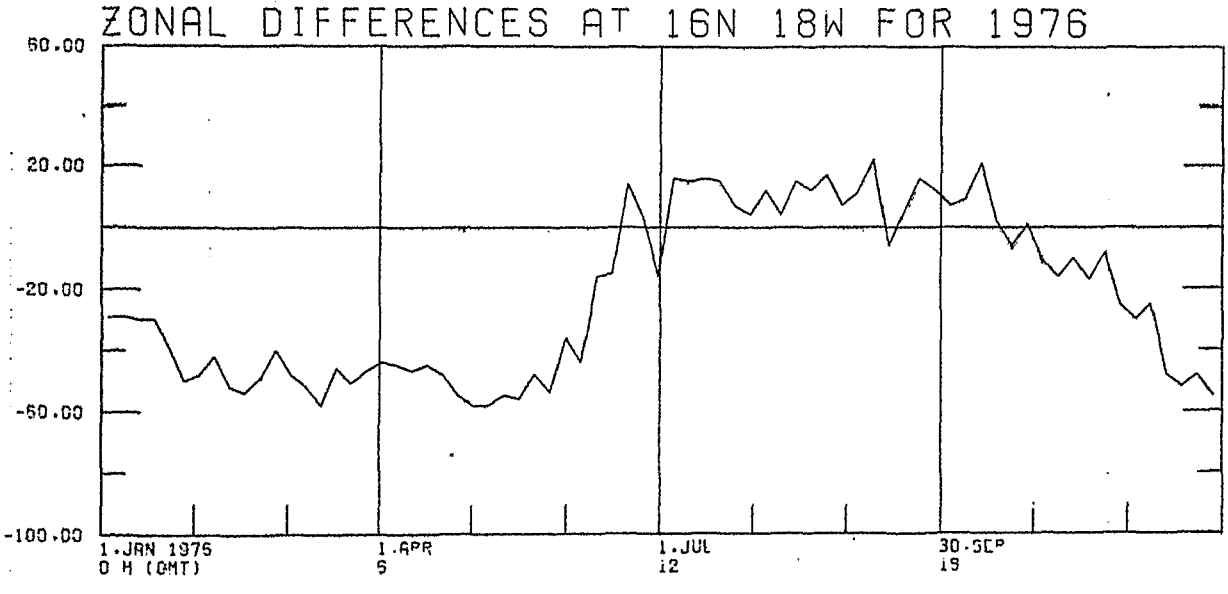

PRESS-DIFF AND OSZ AT J=2 FOR 1976
120.00
90.00
40.00
0.00
-40.00
-90.00
-120.00
1.JAN 1976
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
18

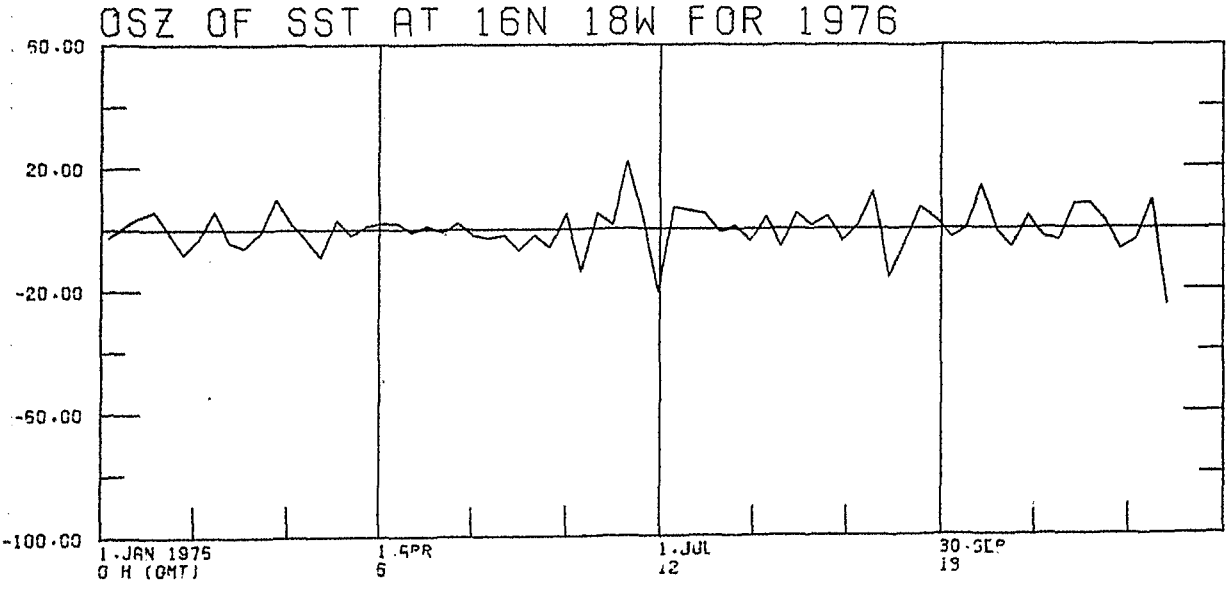

PRESS-DIFF AND OSZ AT J=3 FOR 1976
120.00
90.00
40.00
0.00
-40.00
-90.00
-120.00
1.JAN 1976
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
18

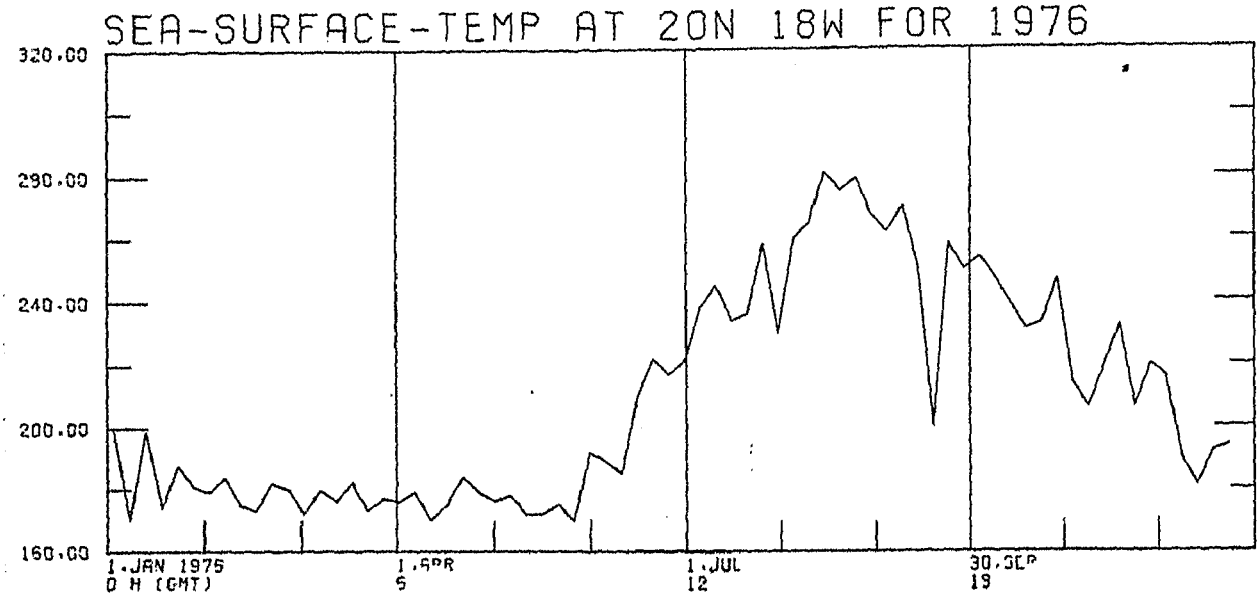

PRESS-DIFF AND OSZ AT J=4 FOR 1976
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1.JAN 1976
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
19

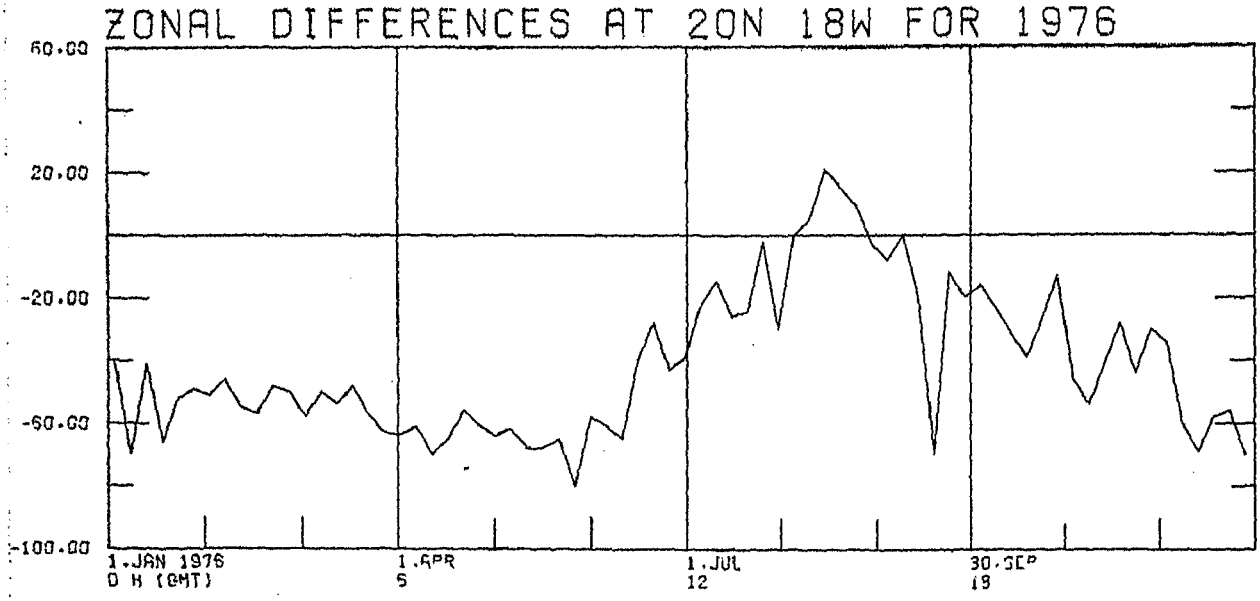

PRESS-DIFF AND OSZ AT J=5 FOR 1976
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
1.JAN 1976
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
19

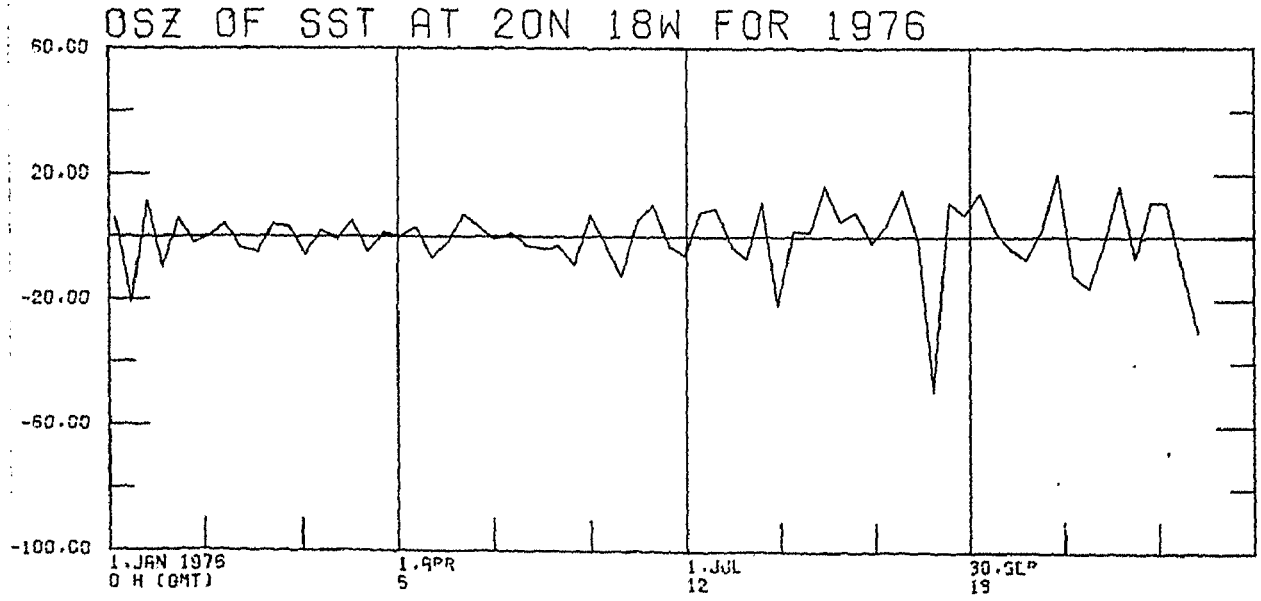

SEA-SURFACE-TEMP AT 16N 18W FOR 1976
320.00
280.00
240.00
200.00
160.00
1.JAN 1976
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
19

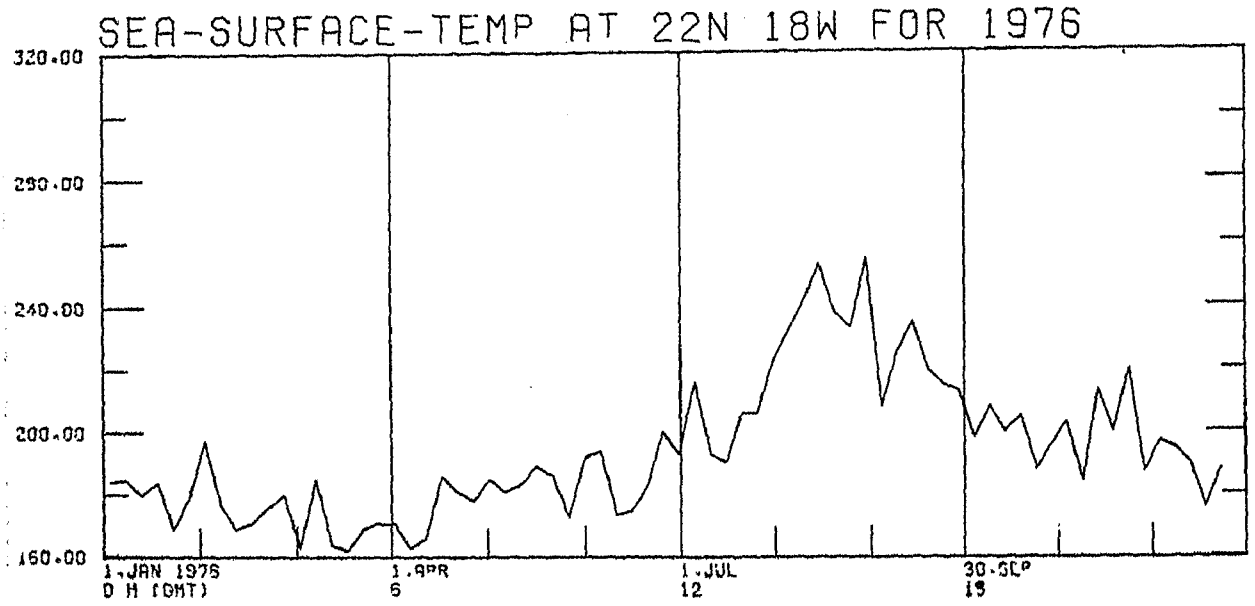

ZONAL DIFFERENCES AT 16N 18W FOR 1976
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1976
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
19


OSZ OF SST AT 16N 18W FOR 1976
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1976
0 H (GMT)
1.APR
6
1.JUL
12
30.SEP
19

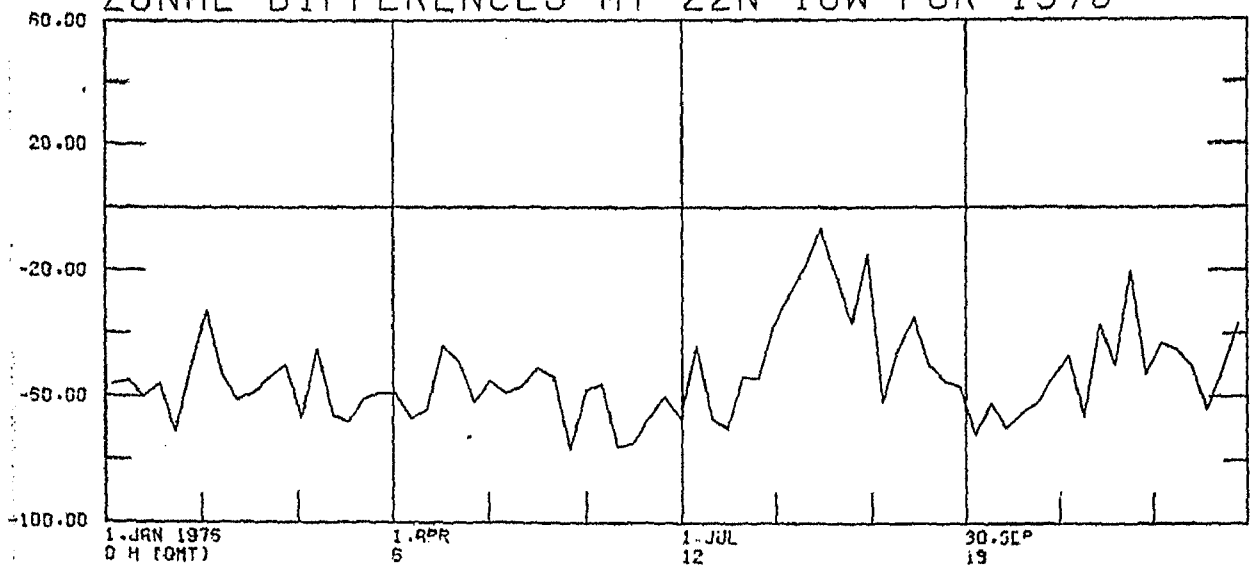

SEA-SURFACE-TEMP AT 20N 18W FOR 1976
320.00
280.00
240.00
200.00
160.00
[1/10DC]
1.JAN 1976
0 H (GMT)
1.APR
5
1.JUL
12
30.SEP
19


ZONAL DIFFERENCES AT 20N 18W FOR 1976
60.00
20.00
-20.00
-60.00
-100.00
[1/10DC]
1.JAN 1976
0 H (GMT)
1.APR
5
1.JUL
12
30.SEP
19

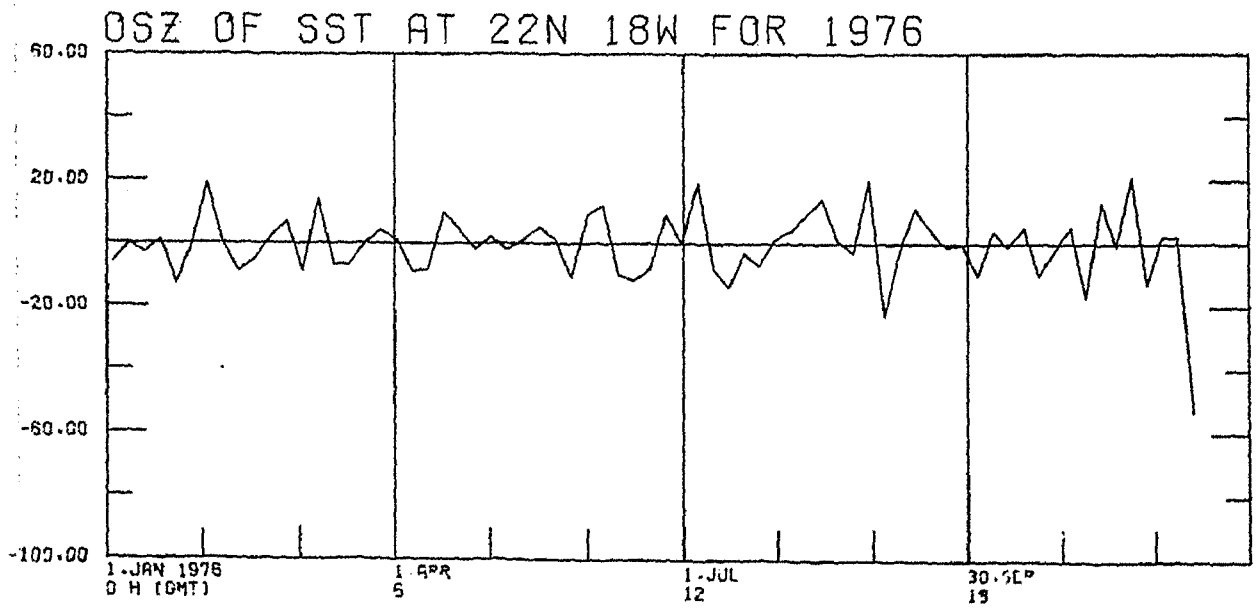

OSZ OF SST AT 20N 18W FOR 1976
60.00
20.00
-20.00
-60.00
-100.00
[1/10DC]
1.JAN 1976
0 H (GMT)
1.APR
5
1.JUL
12
30.SEP
19



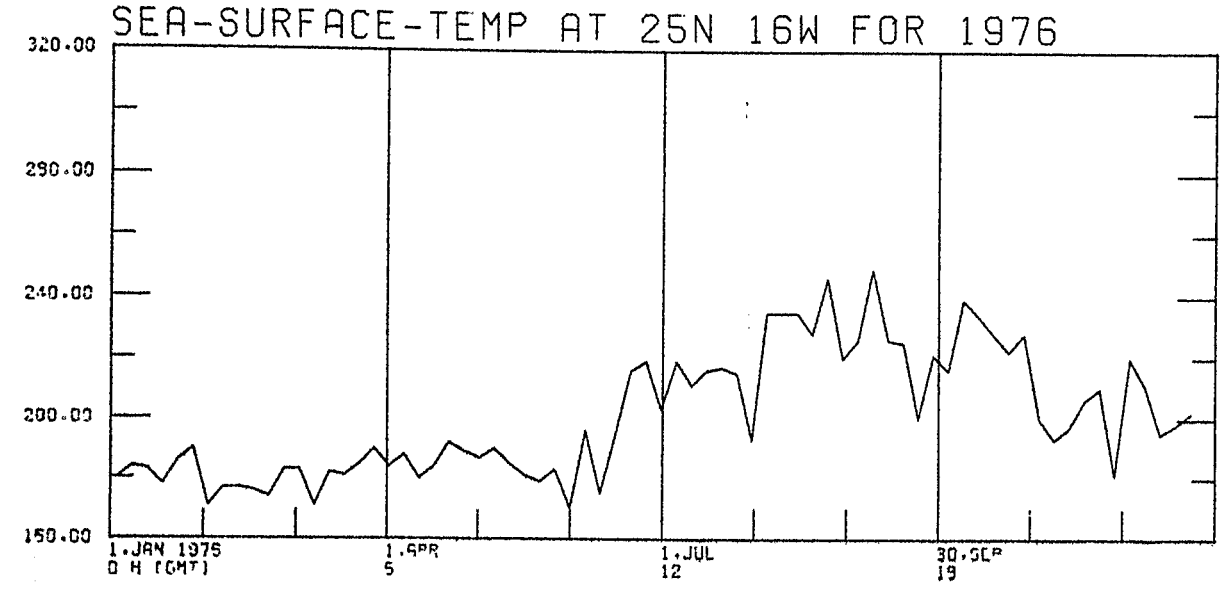
(1/100C)

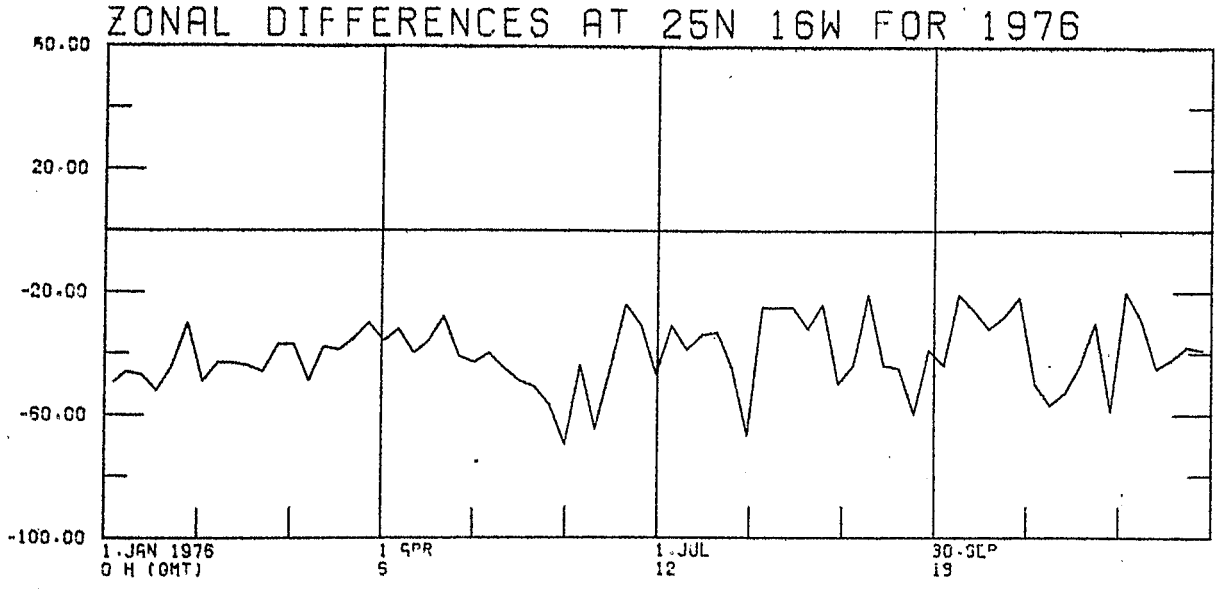


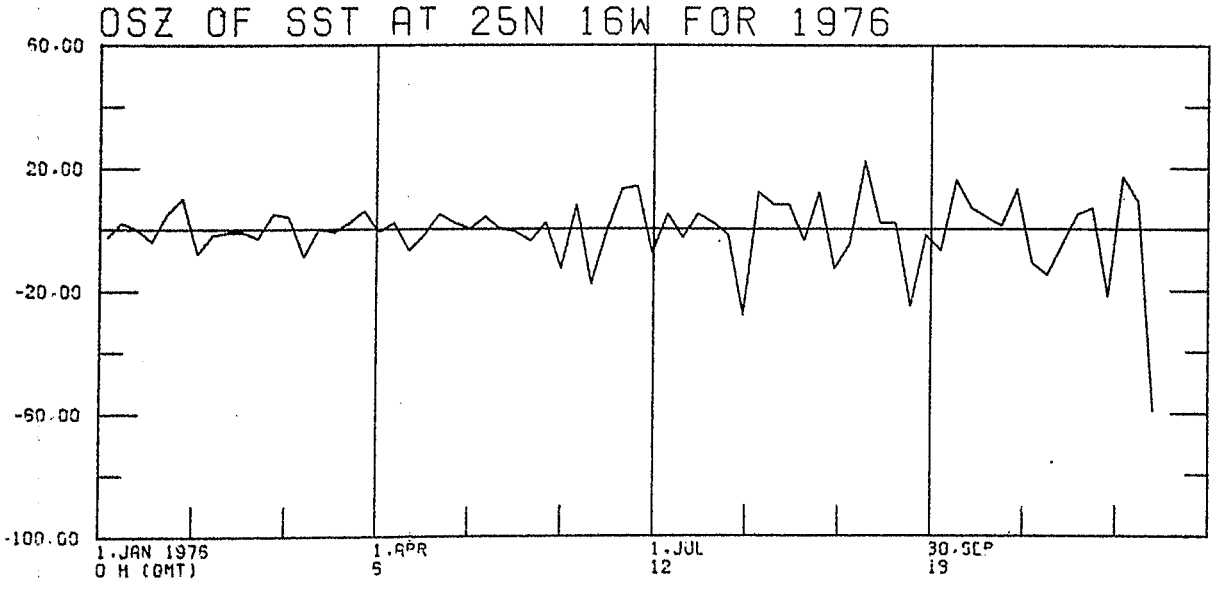
(1/100C)

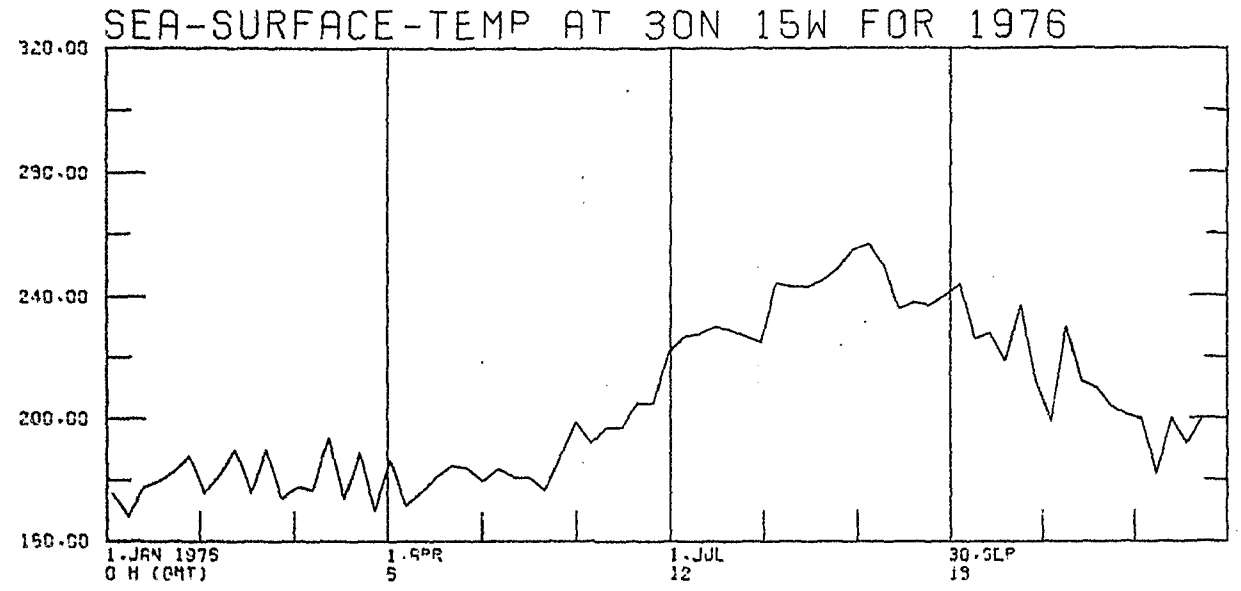


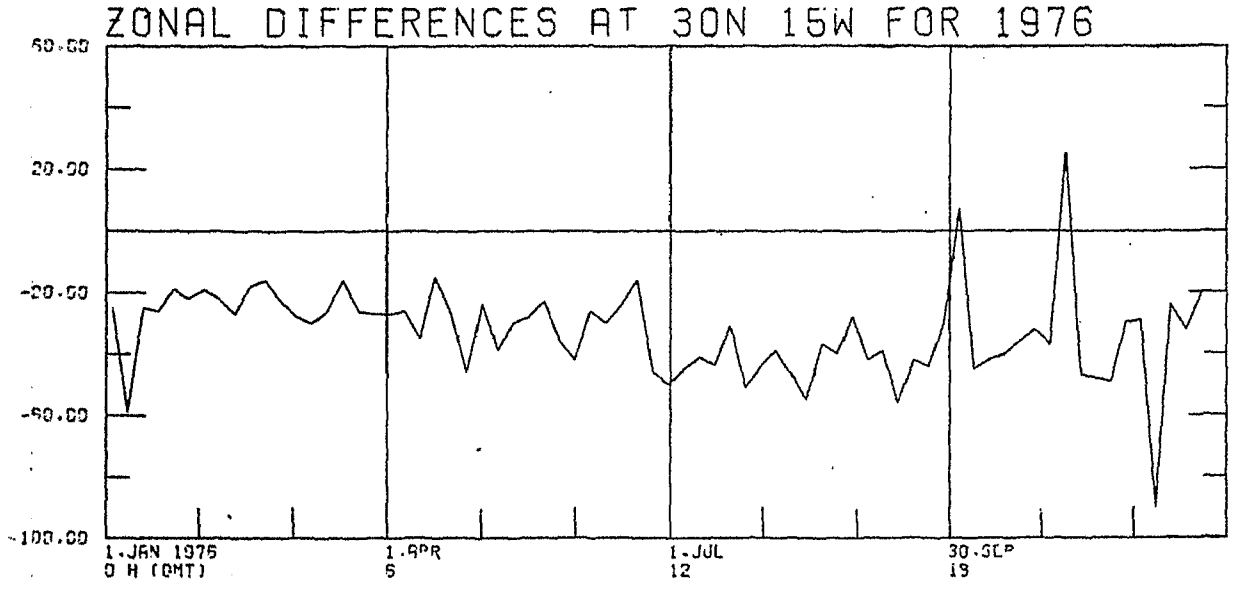
(1/100C)

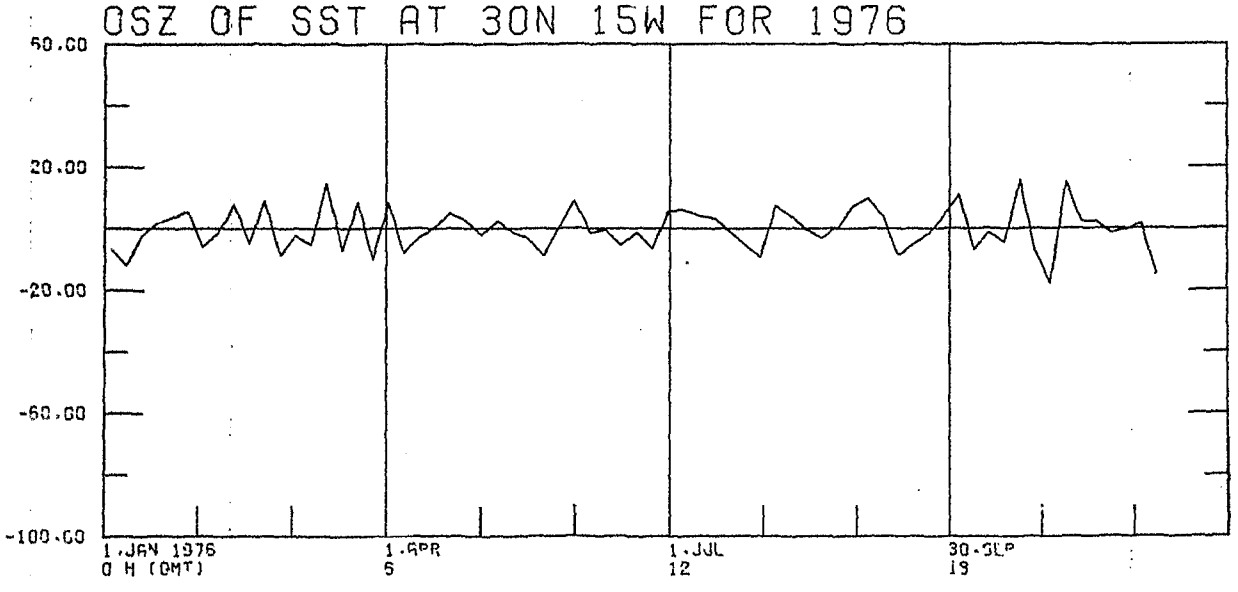

SEA-SURFACE-TEMP AT 25N 16W FOR 1976
320.00
290.00
240.00
200.00
150.00
1.JAN 1976
0 H (GMT)
1.APR
5
1.JUL
12
30.SEP
19

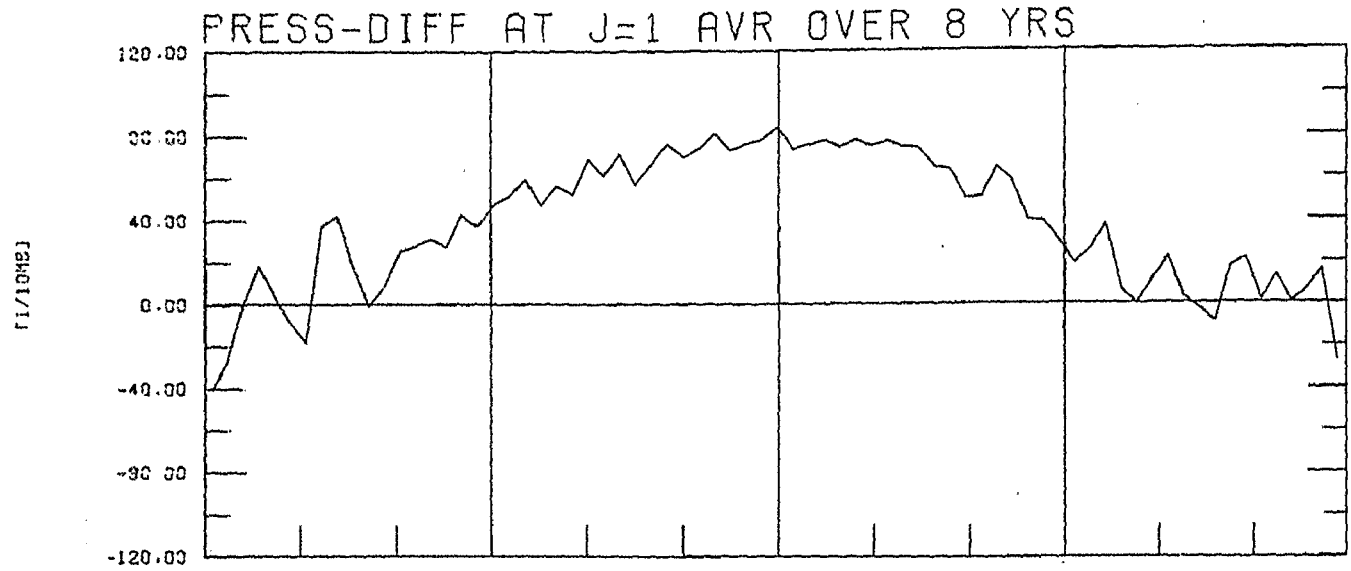

ZONAL DIFFERENCES AT 25N 16W FOR 1976
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1976
0 H (GMT)
1 APR
5
1.JUL
12
30.SEP
19

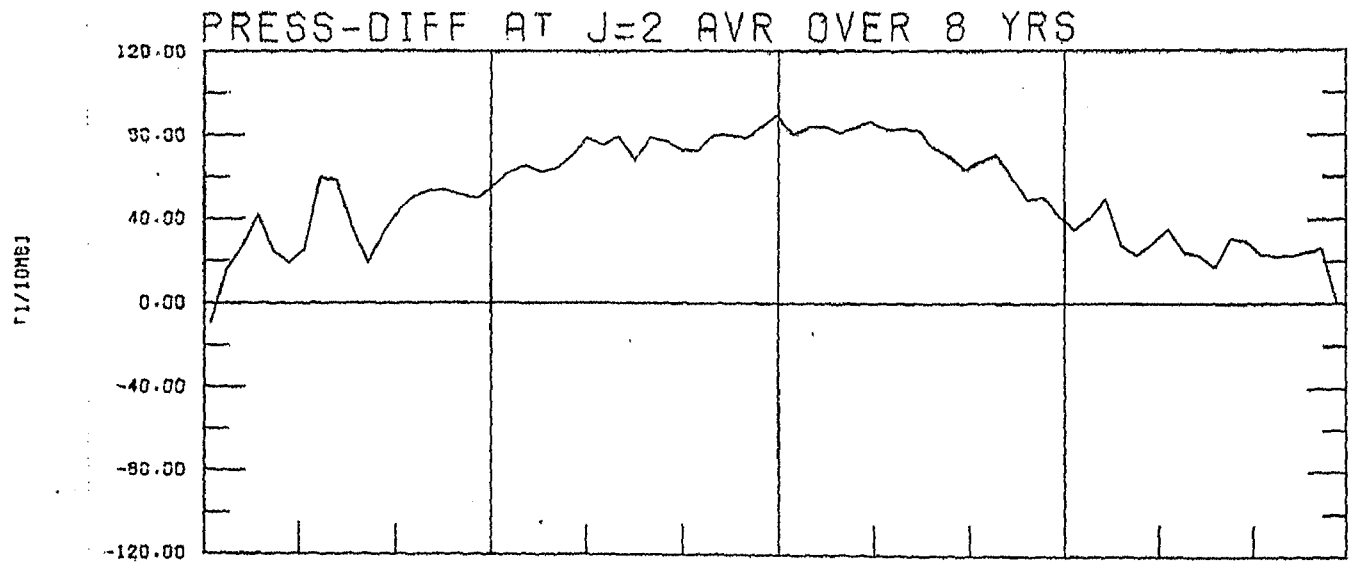

OSZ OF SST AT 25N 16W FOR 1976
60.00
20.00
-20.00
-60.00
-100.00
1.JAN 1976
0 H (GMT)
1.APR
5
1.JUL
12
30.SEP
19

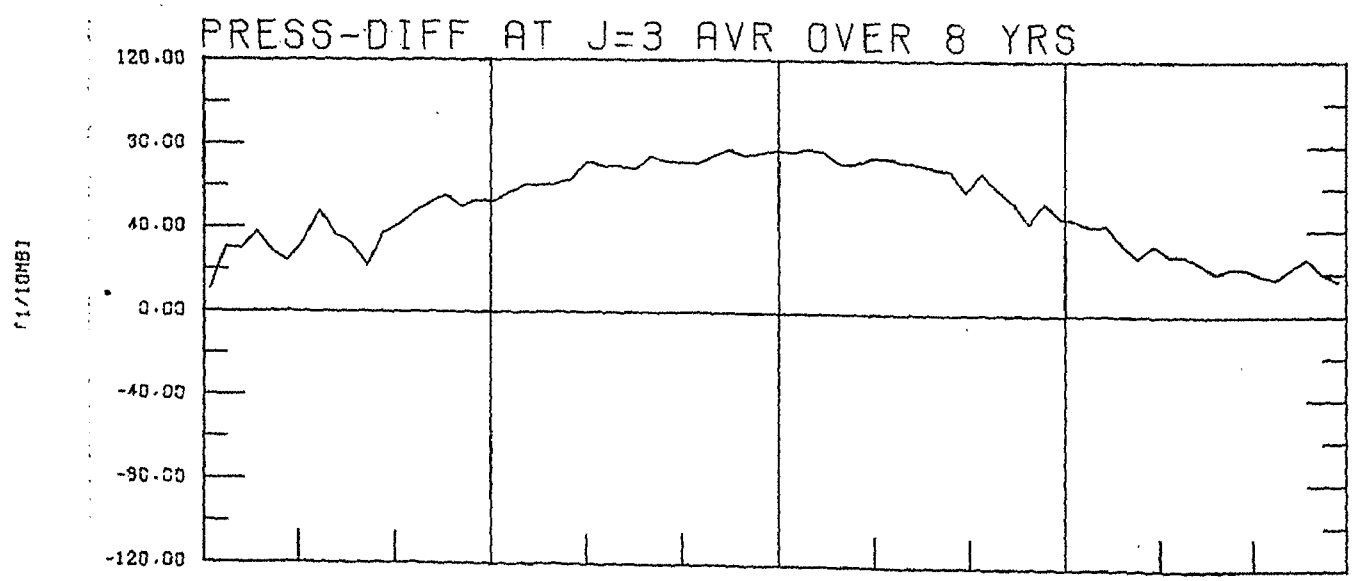

SEA-SURFACE-TEMP AT 30N 15W FOR 1976
320.00
280.00
240.00
200.00
160.00
1-JAN 1976
0 H (GMT)
1-APR
5
1-JUL
12
30-SEP
19

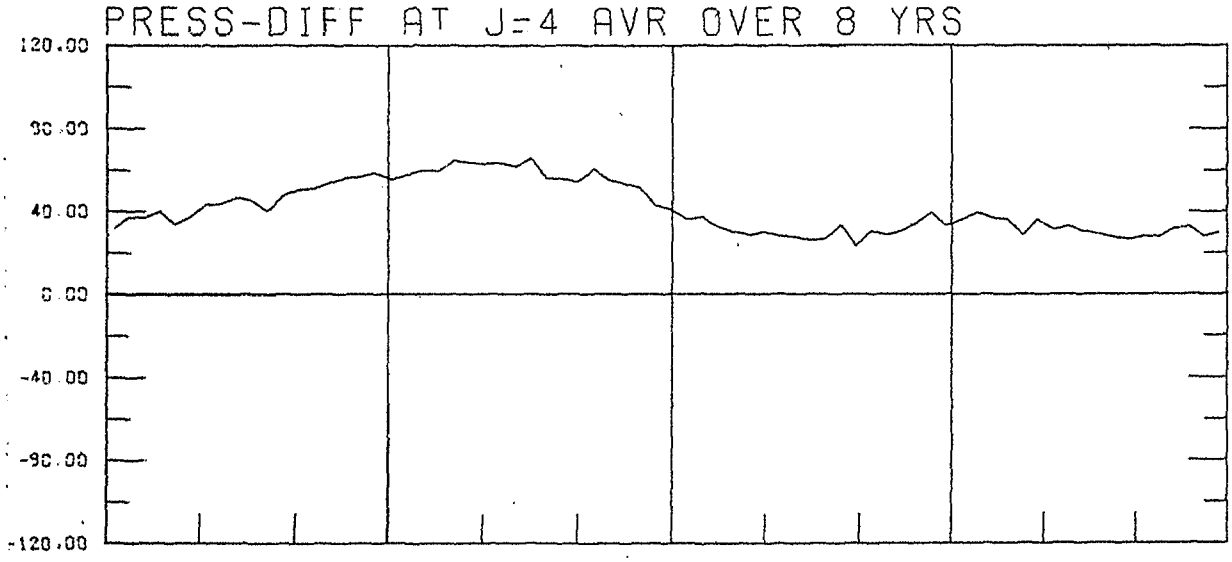

ZONAL DIFFERENCES AT 30N 15W FOR 1976
60.00
20.00
-20.00
-60.00
-100.00
1-JAN 1976
0 H (GMT)
1-APR
5
1-JUL
12
30-SEP
19

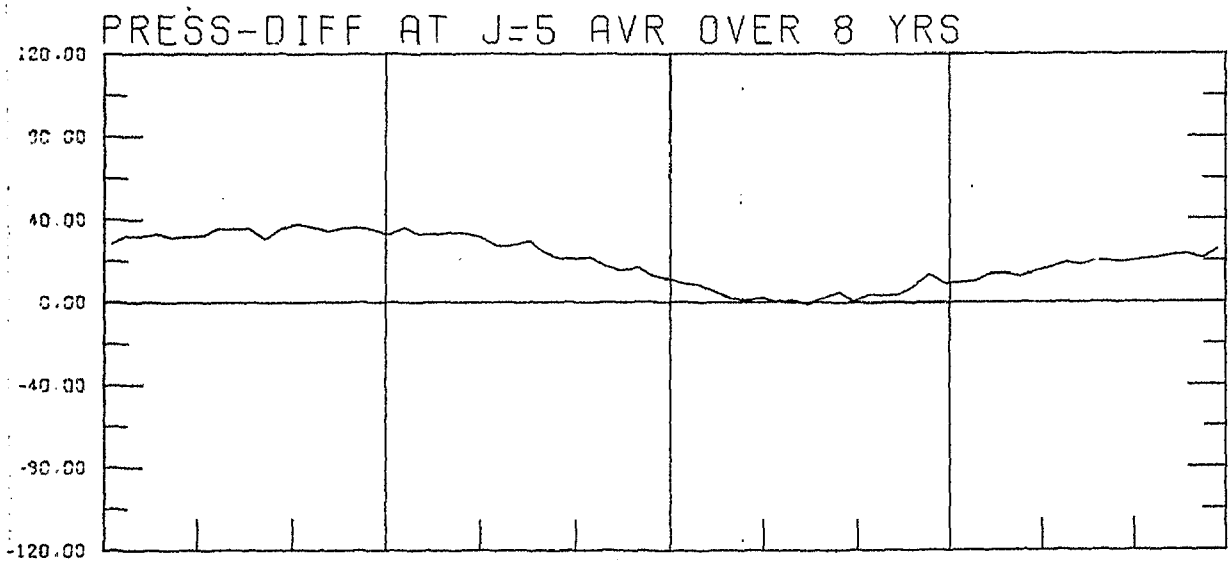

OSZ OF SST AT 30N 15W FOR 1976
60.00
20.00
-20.00
-60.00
-100.00
1-JAN 1976
0 H (GMT)
1-APR
5
1-JUL
12
30-SEP
19

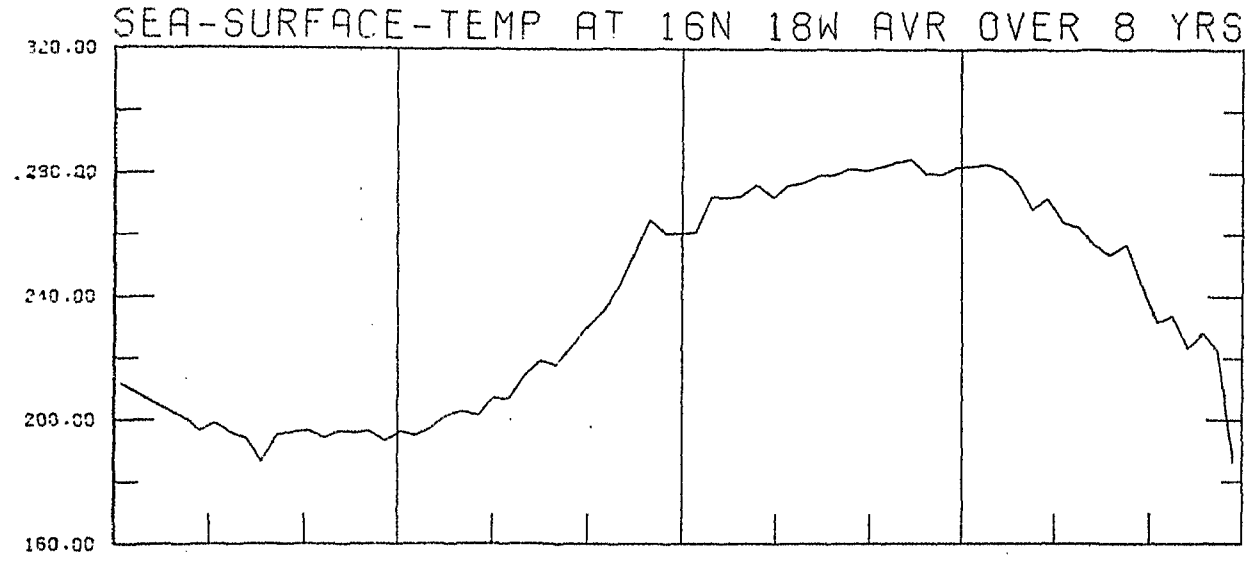

PRESS-DIFF AT J=1 AVR OVER 8 YRS
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
[1/10MB]

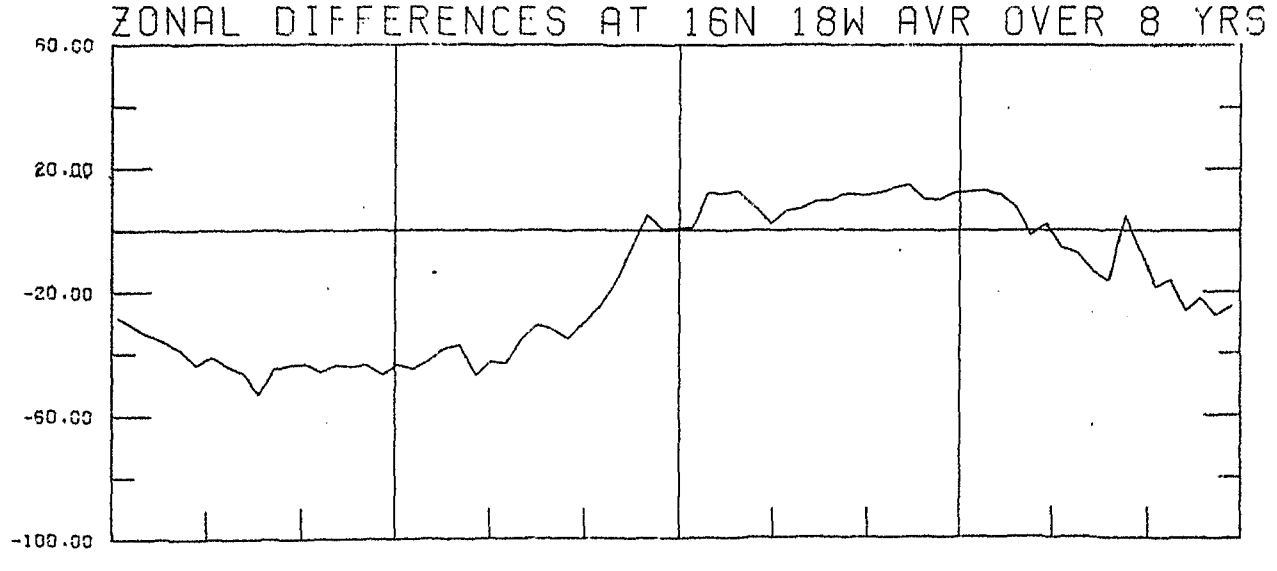

PRESS-DIFF AT J=2 AVR OVER 8 YRS
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
[1/10MB]

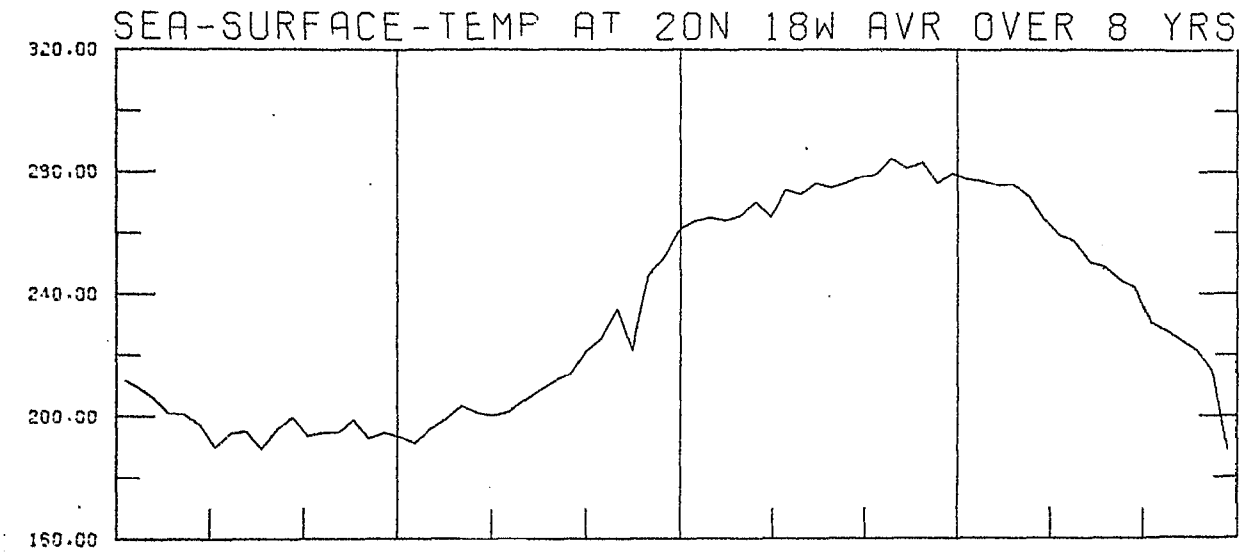

PRESS-DIFF AT J=3 AVR OVER 8 YRS
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
[1/10MB]

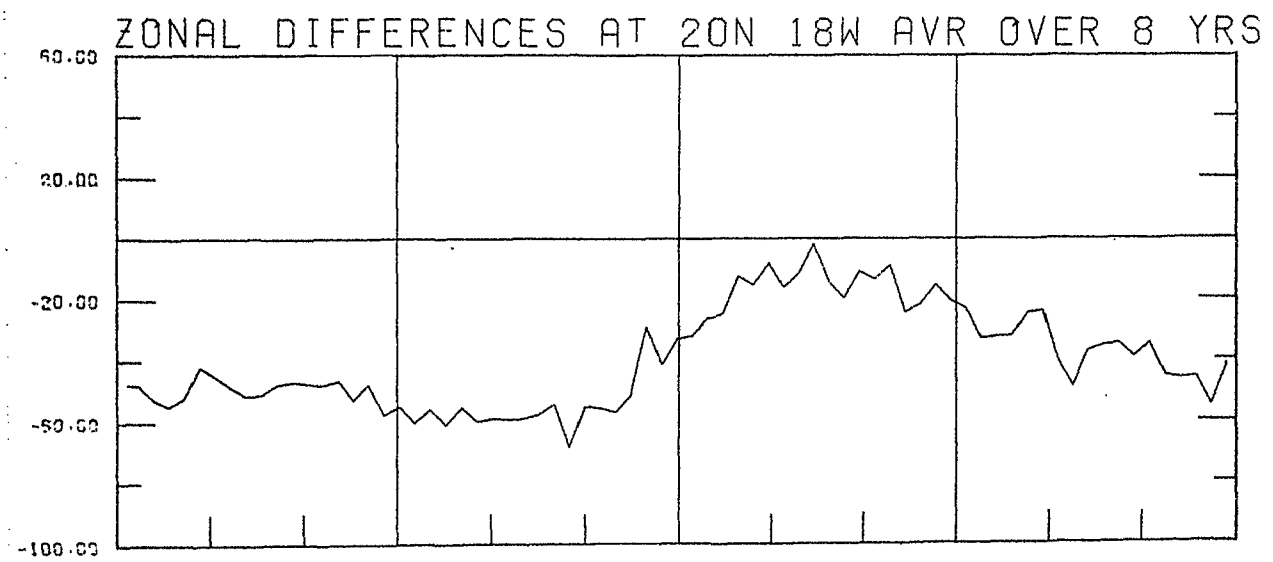

PRESS-DIFF AT J=4 AVR OVER 8 YRS
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00

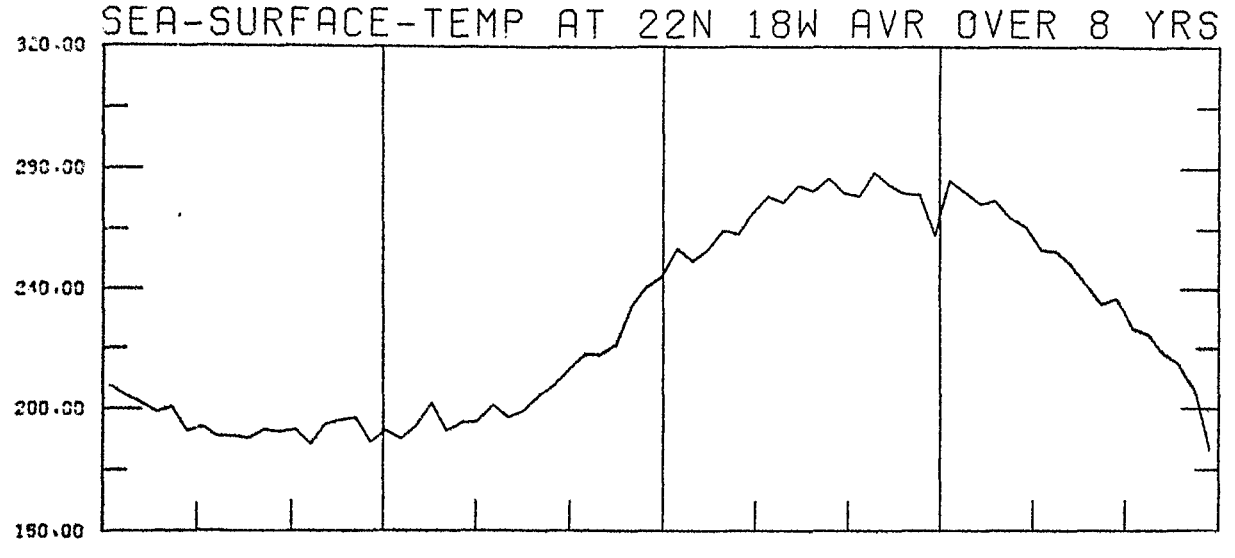

PRESS-DIFF AT J=5 AVR OVER 8 YRS
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00

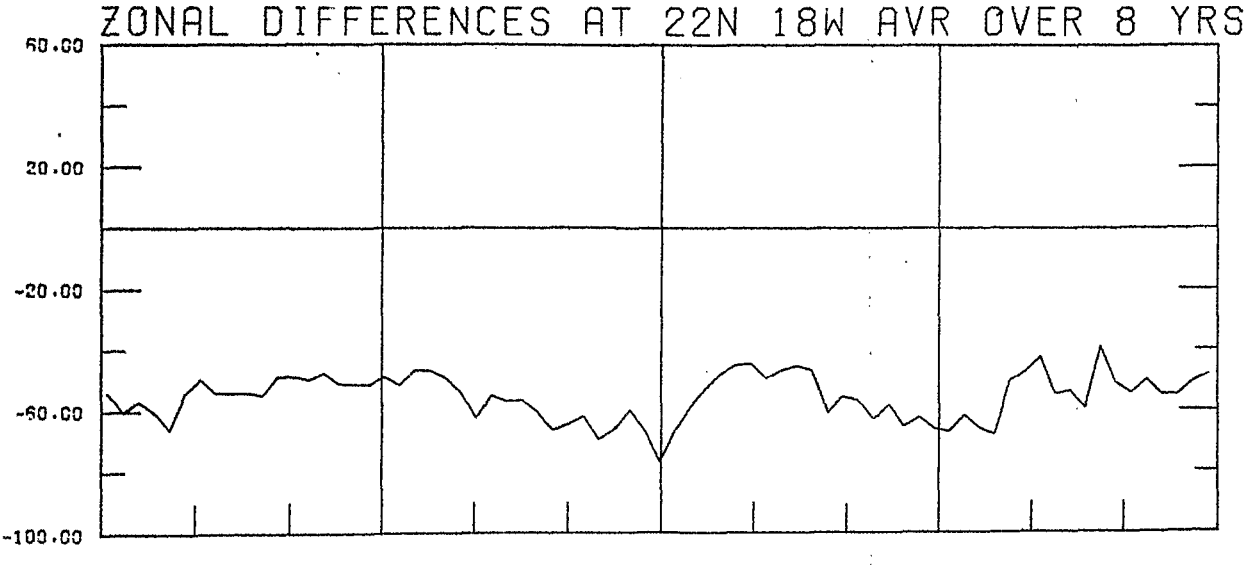

SEA-SURFACE-TEMP AT 16N 18W AVR OVER 8 YRS
320.00
280.00
240.00
200.00
160.00

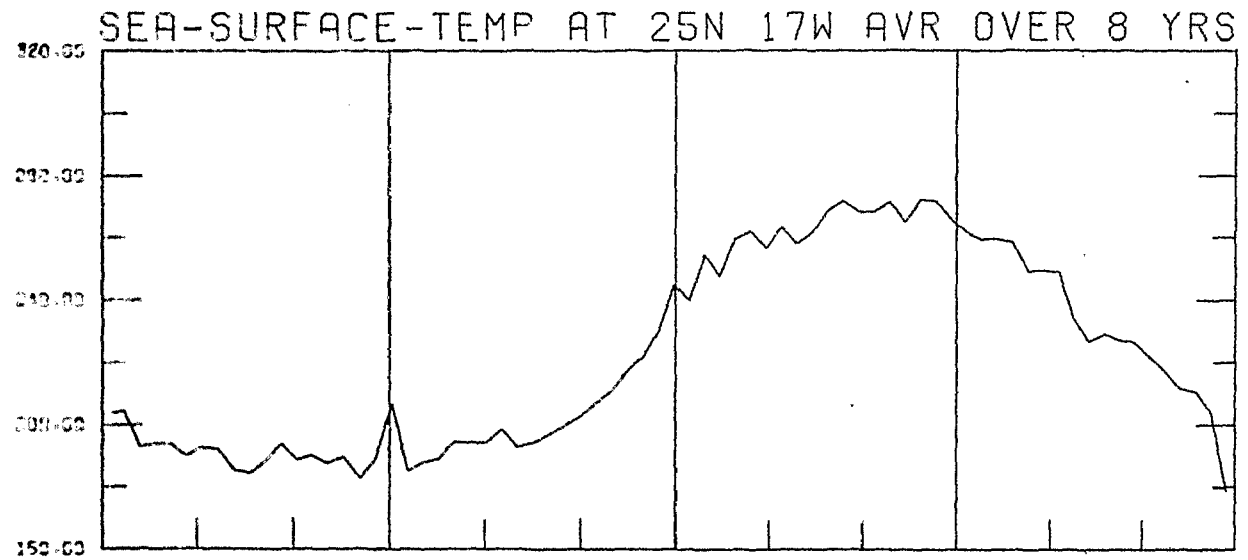

ZONAL DIFFERENCES AT 16N 18W AVR OVER 8 YRS
60.00
20.00
-20.00
-60.00
-100.00

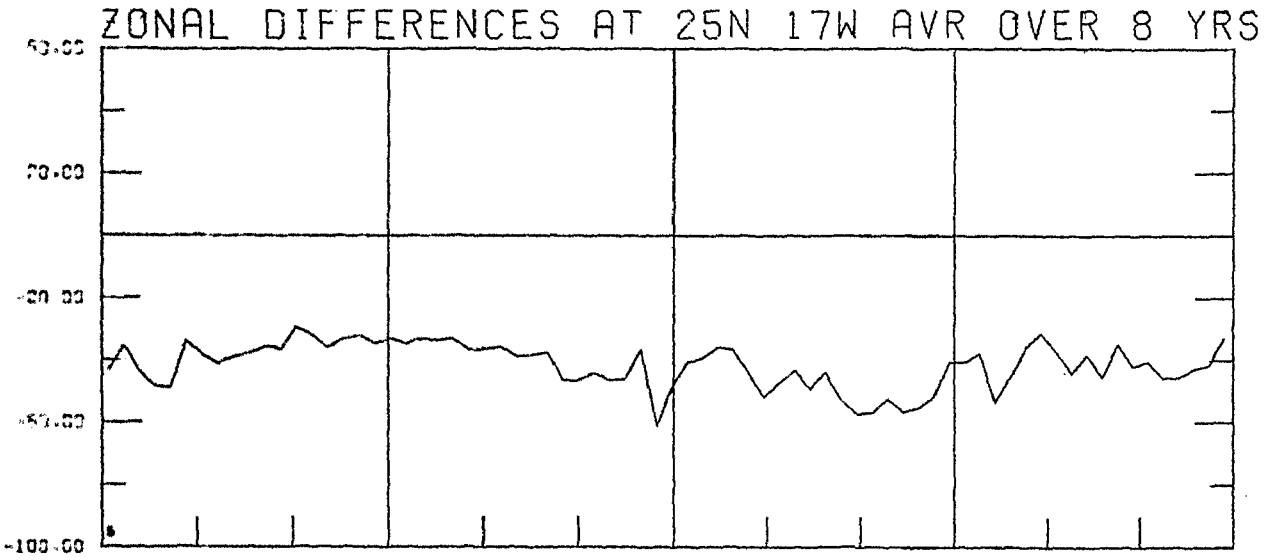

SEA-SURFACE-TEMP AT 20N 18W AVR OVER 8 YRS
320.00
280.00
240.00
200.00
160.00

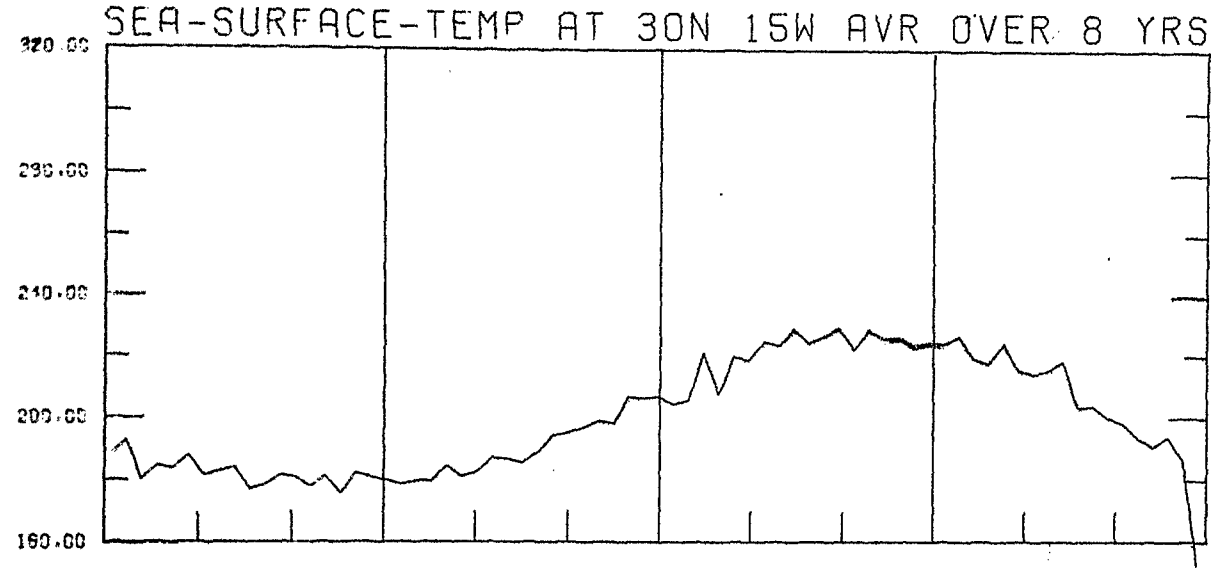

ZONAL DIFFERENCES AT 20N 18W AVR OVER 8 YRS
60.00
20.00
-20.00
-60.00
-100.00

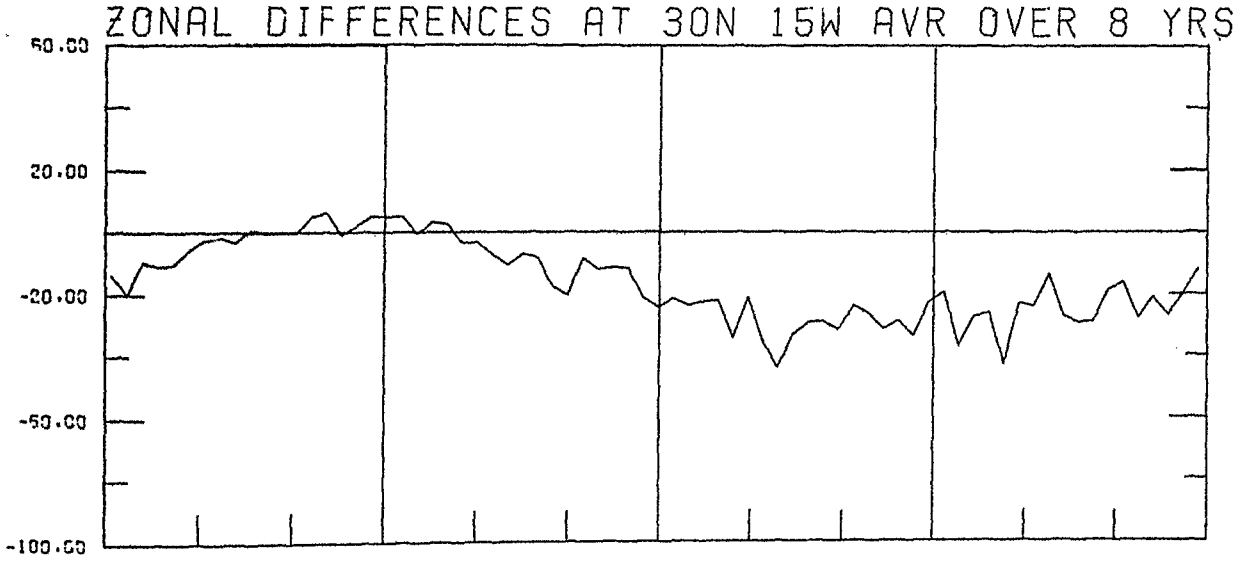

SEA-SURFACE-TEMP AT 22N 18W AVR OVER 8 YRS
320.00
290.00
240.00
200.00
150.00

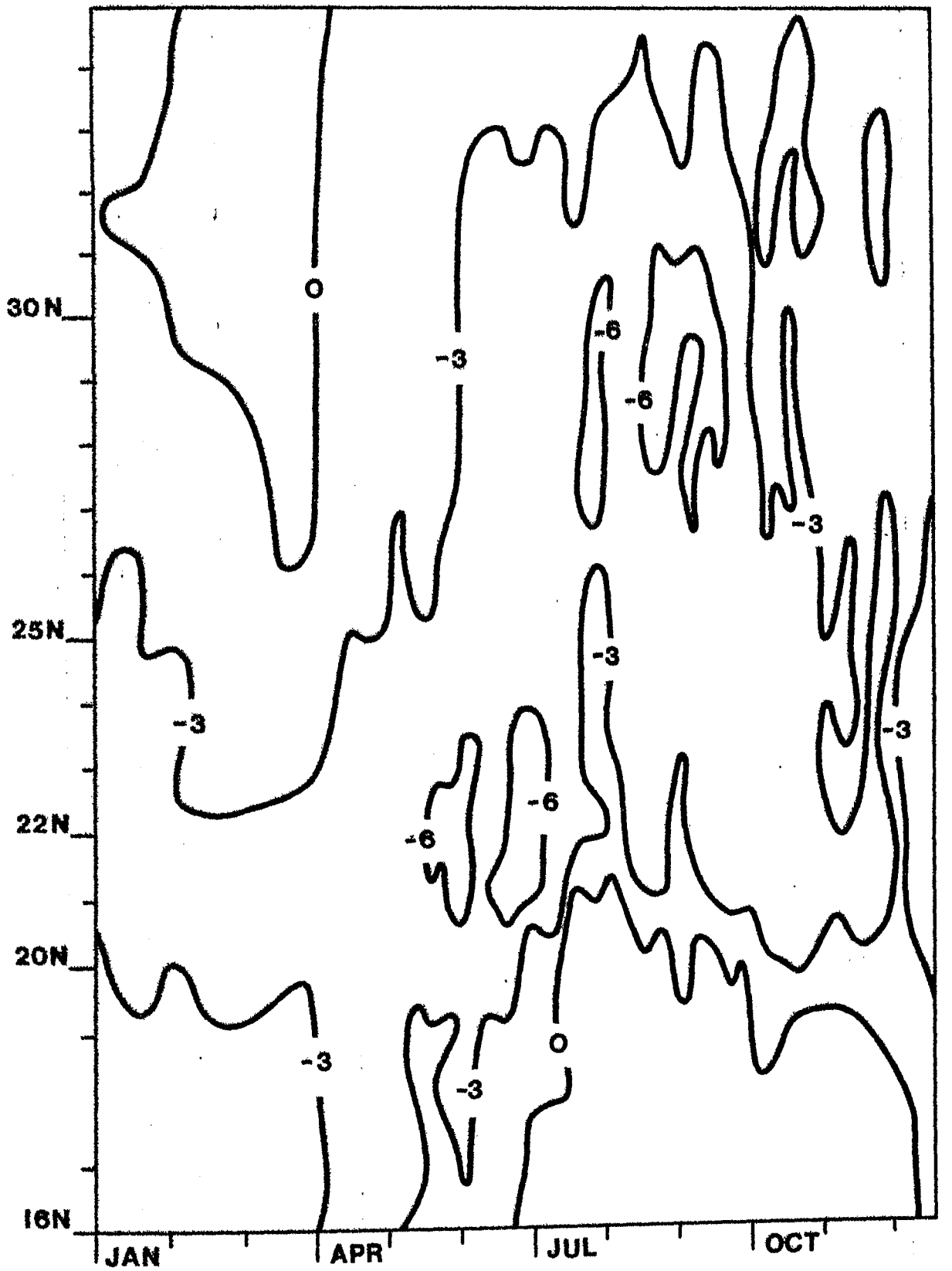

ZONAL DIFFERENCES AT 22N 18W AVR OVER 8 YRS
60.00
20.00
-20.00
-60.00
-100.00

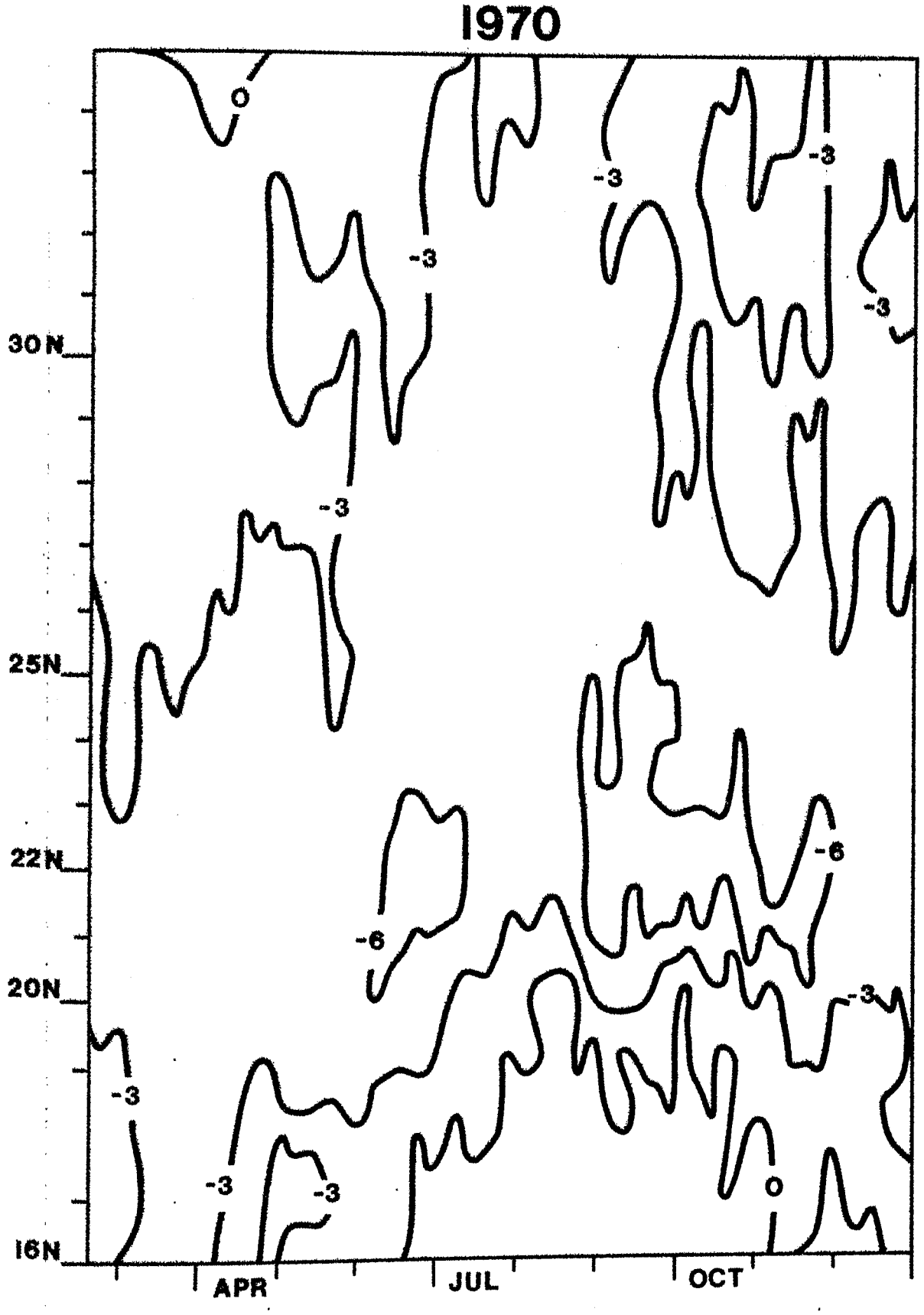

SEA-SURFACE-TEMP AT 25N 17W AVR OVER 8 YRS

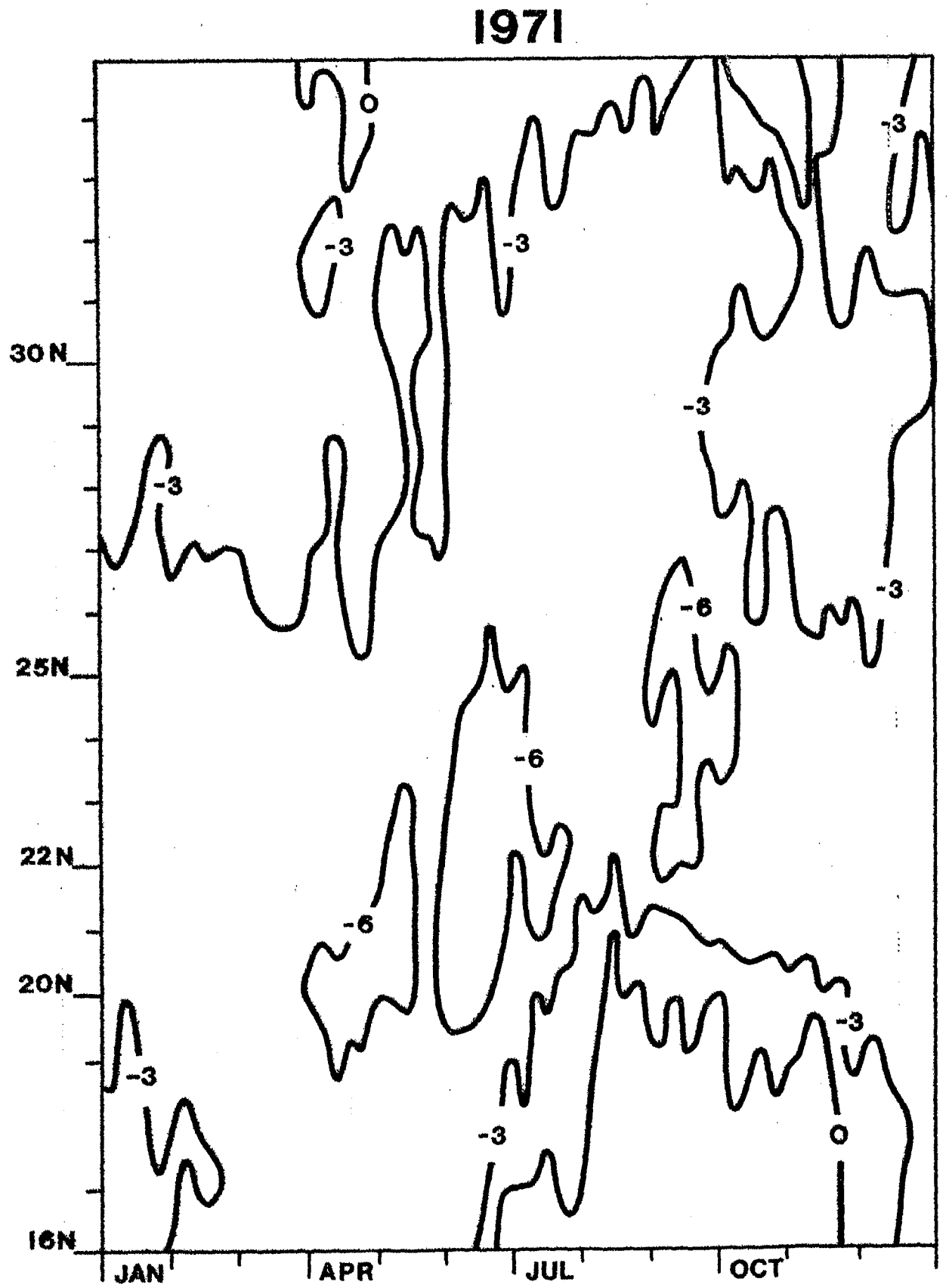

ZONAL DIFFERENCES AT 25N 17W AVR OVER 8 YRS


SEA-SURFACE-TEMP AT 30N 15W AVR OVER 8 YRS
280.00
240.00
200.00
160.00

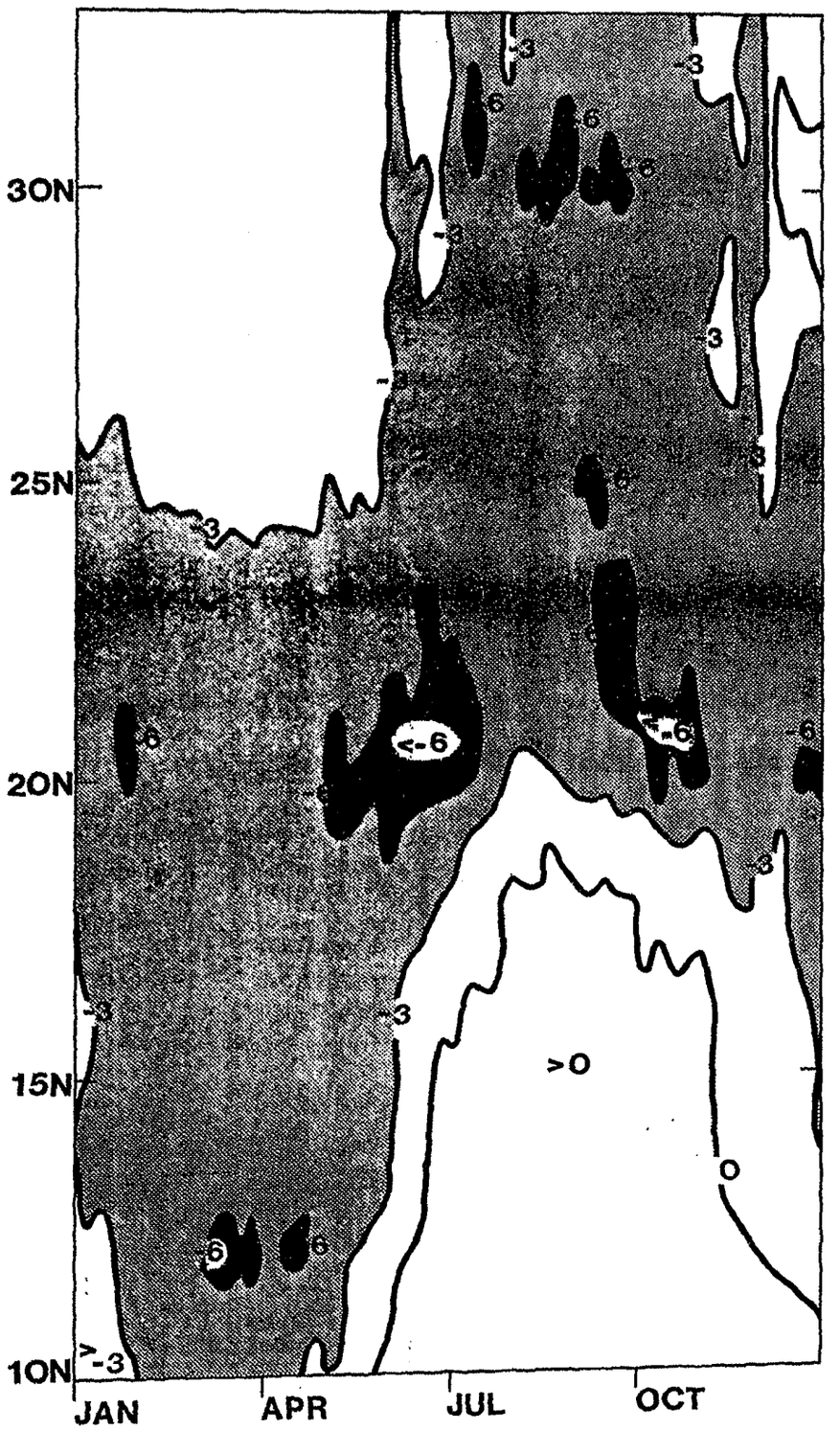

ZONAL DIFFERENCES AT 30N 15W AVR OVER 8 YRS
60.00
20.00
-20.00
-60.00
-100.00


1969
30N
25N
22N
20N
16N
JAN
APR
JUL
OCT
0
-3
-6
-6
-3
-3
-3
-6
-6
-3
-3
0
-3
-3


1970
0
-3
-3
-3
-3
-3
-3
-6
-6
-3
-3
-3
-3
0
30N
25N
22N
20N
16N
APR
JUL
OCT


1971
30N
25N
22N
20N
16N
JAN
APR
JUL
OCT
0
-3
-6

1969 - 1976



entnommen aus SPETH et al. 1978